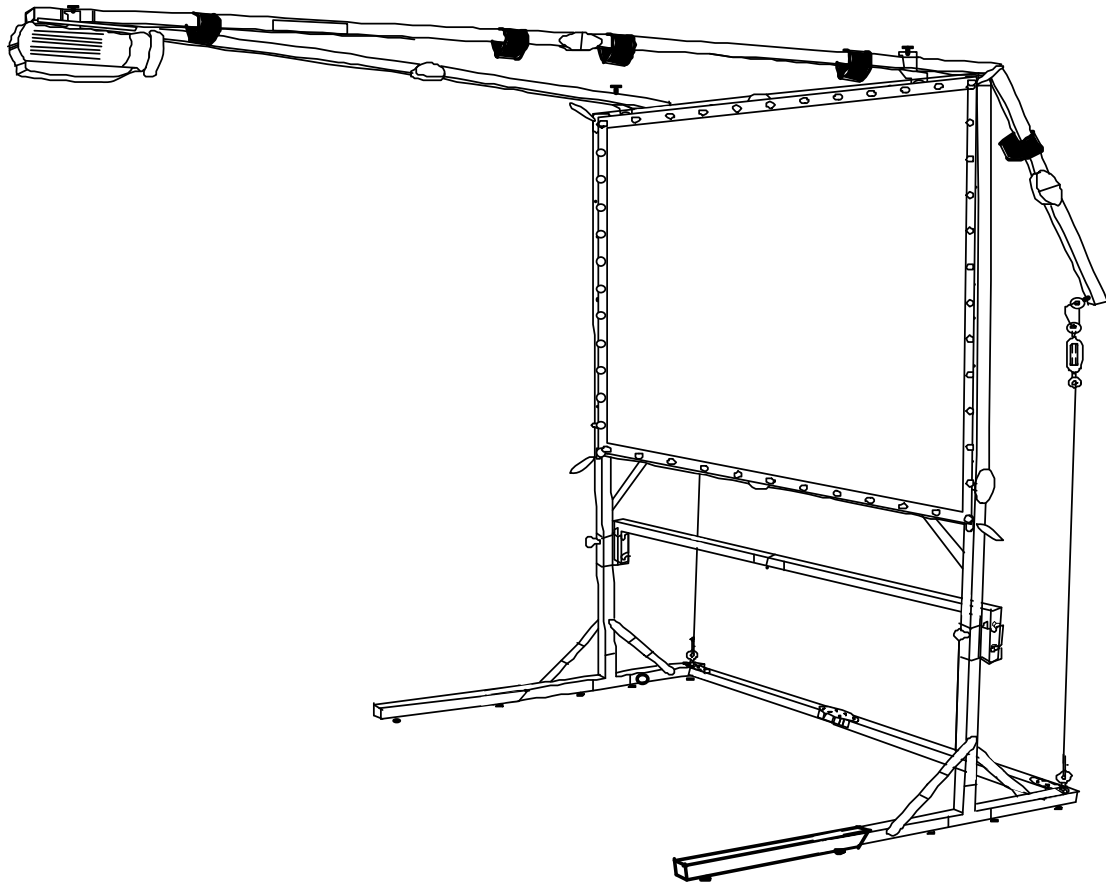

TECHNICAL MANUAL
OPERATOR AND FIELD MAINTENANCE MANUAL
FOR
DC2E*
MEDIUM XGA PROJECTION SYSTEM
SYSTEM PART NUMBER 1008821



**ISO 9001: 2000 Registered
Quality Management System**

*Deployable Command & Control Equipment

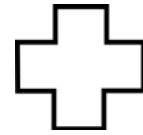
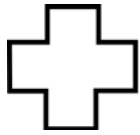
TECH MANUAL PART NUMBER: 1006379
RELEASE DATE: 30 APR 10

Fax: 256-774-1567

Hotline: 800-977-3647

Web: www.drash.com

Email: drash@drash.com

**5**

SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK.

1

SEND FOR HELP AS SOON AS POSSIBLE.

2

DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL.

3

IF POSSIBLE, TURN OFF THE ELECTRICAL POWER.

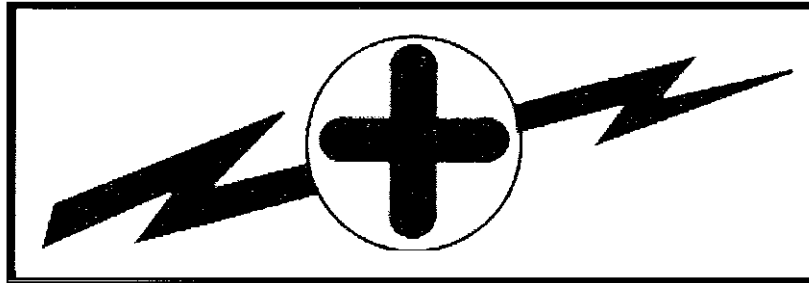
4

IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE, OR A DRY ROPE, OR SOME OTHER INSULATING MATERIAL.

5

AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION.

WARNING



HIGH VOLTAGE

is used in operation of this equipment.

DEATH ON CONTACT

may result if personnel fail to observe safety precautions.

Never work on electronic equipment unless there is another person nearby who is familiar with operation and hazards of the equipment and who is competent in administering first aid. When operators aid the technician, the technician must warn operators about dangerous areas.

When possible, shut off power supply to equipment before beginning work on equipment. Take particular care to ground every capacitor that could potentially store a dangerous electrical charge. Turn off power when working inside equipment. Always ground every part of equipment before touching it.

Be careful to not contact high-voltage connections or 115 VAC input connections when installing or operating equipment.

Whenever the nature of operation permits, keep one hand away from equipment to reduce hazard of current flowing through the body.

WARNING: Do not be misled by the term “low voltage.” Under adverse conditions, potentials as low as 50 volts may cause death.

For Artificial Respiration, refer to FM 4-25.11.



ELECTRICAL HAZARD

Under adverse conditions, voltage used in this equipment can cause death or serious injury. Observe the following safety precautions:

GROUND THE EQUIPMENT

Before connecting primary power cables; connect grounding cable from ground lug on power control box to earth ground. Do not remove grounding cable until signal cables and primary power cables have been disconnected and generator has been shut down.

AVOID THE POWER INPUT

Be careful not to contact 115 VAC input connections when installing or servicing equipment.

DO NOT SERVICE ALONE

Never work on equipment unless there is another person nearby who is familiar with operation and hazards of equipment and who can administer first aid.

USE ONLY ONE HAND

Whenever possible, use only one hand to service equipment. Keep other hand away to reduce hazard of current flowing through vital organs of the body.

WARNING



BURN HAZARD

Equipment may be hot to touch. Allow unit to cool before handling or use gloves when handling. Failure to observe this warning can result in serious injury.

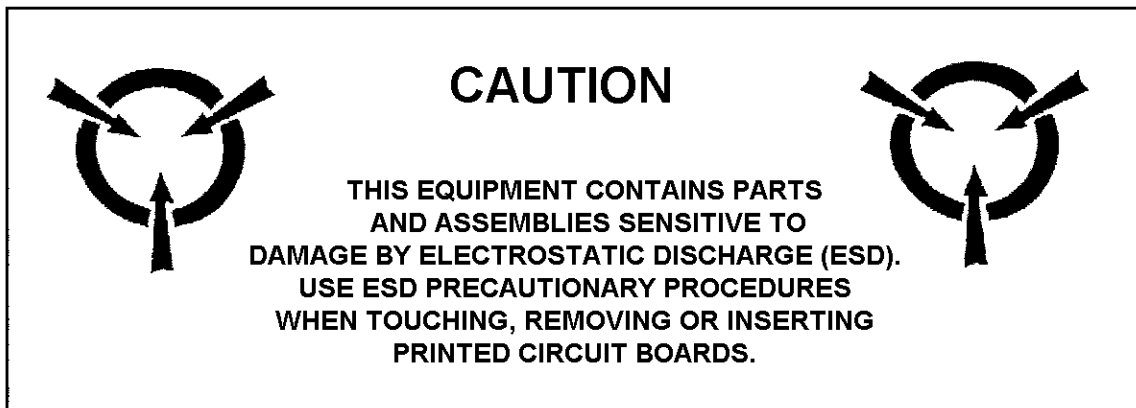
WARNING



HEAVY EQUIPMENT

Improperly lifting or carrying heavy equipment can result in serious injury or death. Refer to the following weight limits as guidelines:

Handling Function	One-Person Max. Lift	Two-Person Max. Lift	Two-Person Max. Lift (Male Only)
Lift object from floor and place it on surface not greater than 5 feet above floor.	37 lb.	74 lb.	112 lb.
Lift object from floor and place it on surface not greater than 3 feet above floor.	44 lb.	88 lb.	174 lb.
Carry object 33 feet or less.	42 lb.	84 lb.	164 lb.



ESD

CLASS 1

GENERAL HANDLING PROCEDURES FOR ESD ITEMS

- USE WRIST GROUND STRAPS OR MANUAL GROUNDING PROCEDURES.
- KEEP ESD ITEMS IN PROTECTIVE COVERING WHEN NOT IN USE.
- GROUND ALL ELECTRICAL TOOLS AND TEST EQUIPMENT.
- PERIODICALLY CHECK CONTINUITY AND RESISTANCE OF GROUNDING SYSTEM.
- USE ONLY METALIZED SOLDER SUCKERS.
- HANDLE ESD ITEMS IN PROTECTED AREAS ONLY.

MANUAL GROUNDING PROCEDURES

- MAKE CERTAIN EQUIPMENT IS POWERED DOWN.
- TOUCH GROUND PRIOR TO REMOVING ESD ITEMS.
- TOUCH PACKAGE OR REPLACEMENT ESD ITEM TO GROUND BEFORE OPENING.
- TOUCH GROUND PRIOR TO INSERTING REPLACEMENT ESD ITEMS.

ESD PROTECTIVE PACKAGING AND LABELING

- COVER ANTISTATIC MATERIAL WITH AN OUTER WRAP OF EITHER TYPE 1 ALUMINIZED MATERIAL OR CONDUCTIVE PLASTIC FILM OR HYBRID LAMINATED BAGS HAVING AN INTERIOR OF ANTISTATIC MATERIAL WITH AN OUTER METALIZED LAYER.
- LABEL WITH SENSITIVE ELECTRONIC SYMBOL AND CAUTION NOTE.

WARNING

HIGH VOLTAGE is produced when this unit is in operation. Death or severe burns may result if personnel fail to observe safety precautions.

WARNING

To avoid possible electrical shock, do not remove grounding cable until signal cables and primary power cables have been disconnected.

WARNING

Remove all rings, watches, and other jewelry when performing maintenance on this equipment. Secure all loose fitting clothing to prevent from being caught in moving or rotating parts. Death or loss of limb may result.

WARNING

Do not attempt to service or otherwise make any adjustments, connections or reconnection of wires or cables until J series Front/Rear Projection System is shut down and completely de-energized. Death or severe burns may result.

WARNING

Trichlorotrifluoroethane, trichloroethane, and similar chemical solvents threaten public health and the environment by destroying ozone in earth's upper atmosphere. Use only nonhazardous cleaning material such as a white clean cloth, water, and mild detergent.

WARNING

The screen surface must be stored in its pouch when not in use to prevent damage and discoloration. While in storage, avoid extreme temperature conditions. If surface becomes sticky, see cleaning instructions (WP 0016). If stored at temperatures far below room temperatures, allow the screen to warm up to room temperature before unfolding. This will ensure the film is being handled in its most flexible state and will prevent surface cracks.

TECHNICAL MANUAL
OPERATOR AND UNIT SUPPORT MAINTENANCE MANUAL
FOR
DC2E
MEDIUM XGA PROJECTION SYSTEM

TABLE OF CONTENTS

WP Sequence No.

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THEORY OF OPERATION**

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HOW TO USE THIS MANUAL

PURPOSE AND SCOPE

This technical manual provides Operator and Unit level maintenance information for the Medium XGA Projection System. The information includes equipment description and theory of operation, operator instructions, troubleshooting procedures, maintenance and testing procedures, and supporting data.

ARRANGEMENT, IDENTIFICATION AND LOCATION OF FRONT MATTER, REAR MATTER, CHAPTERS, AND WORK PACKAGES

This manual is composed of front matter, chapters containing Work Packages (WPs), appendixes, and rear matter. These areas are described in greater detail in the following paragraphs.

Front Matter

The front matter includes such items as the Warning Summary, List of Effective Pages/WPs, Table of Contents, and How to Use This Manual.

Chapters and WPs

The WPs contain information pertinent to the performance of specific tasks. Each WP is maintained as a separate entity. The WPs are grouped into chapters based on overall content. WPs are arranged in numerical sequence regardless of chapter division. The chapter divisions and the WPs contained within the chapters are listed in the Table of Contents. The contents of each chapter are outlined briefly in the following paragraphs.

Chapter 1 - General Information, Equipment Descriptions, and Theory of Operation. This chapter provides general and descriptive information concerning the equipment. Theory of Operation appropriate to the maintenance level covered is also provided.

Chapter 2 - Operator Instructions. This chapter provides a description and location of the controls, indicators, and connectors on each piece of equipment used in the Medium XGA+ Projection System. It also contains a description and location of the decals and data plates for each piece of equipment and operation under usual and unusual conditions.

Chapter 3 - Operator Troubleshooting Procedures. This chapter provides operational checkout and troubleshooting procedures appropriate to the maintenance level covered.

Chapter 4 – Operator Maintenance Procedures. This chapter provides troubleshooting/fault isolation procedures appropriate to the maintenance level covered.

Chapter 5 – Destruction of Equipment. This chapter provides procedures for Destruction of Equipment.

Chapter 6 – Supporting Information. Included is a list of reference material, the Components of End Item (COEI) list.

Identifying WPs

Each WP is identified by a six-digit number. The first four digits are assigned sequentially. The last two digits, if other than 00 (01, 02, 03, etc.), indicate WP revision level. WPs are revised due to equipment configuration differences, support equipment differences, or other similar situations. For example:

- WP 0005 00 might cover installation of a cable on a basic unit.
- WP 0005 01 might cover installation of the same cable on a differently configured unit.
- Installation of an alternate handle in place of the original handle, requiring a different procedure.
- Installation of the handle using an alternate technique or different tools.
- Installation of the handle using alternate fasteners.

Locating WPs

There are two ways to locate a WP when the number is not known, using the Table of Contents in the manual's front matter and using the Index in the manual's rear matter.

Locating a WP in the Table of Contents

First determine the category of the WP subject and then find the appropriate chapter in the Table of Contents. Scan the WP titles in that chapter until the WP subject matter is found. In the example below, it is desired to locate the PMCS for the Operator (shaded). PMCS falls into the category of maintenance. Go to the Table of Contents and find the chapter titled "Operator Maintenance Instructions." (Make sure the chapter applies to the appropriate maintenance level). Scan the WP titles within that chapter until "PMCS" is found, and follow the leader line to find the WP number.

TABLE OF CONTENTS	
	<u>WP Sequence No.</u>
WARNING SUMMARY	
HOW TO USE THIS MANUAL	
CHAPTER 1 - GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION	
General Information.....	WP 0001
Equipment Data and Description.....	WP 0002
Theory of Operation	WP 0003
CHAPTER 2 - OPERATOR INSTRUCTIONS	
Description and Use of Operator Controls, Indicators and Connections.....	WP 0004
Medium XGA Projection System Setup/Takedown Procedures	WP 0005
Medium XGA Multiple Screens Setup/Takedown Procedures.....	WP 0006
Projector & Screen Adjustment Procedures.....	WP 0007

WP CONTENT AND PRESENTATION

The content and the presentation techniques used in the WPs vary according to the material covered.

Common Features

In all cases, the WP title is placed at the top of the page immediately below the manual and WP number and is set off by horizontal lines as shown below.

Medium XGA Projection System	0002
GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION	
MEDIUM XGA PROJECTION SYSTEM	
EQUIPMENT DATA AND DESCRIPTION	

On the second and subsequent pages of the WP, the manual and WP number is repeated.
The page number is placed at the bottom of the page and consists of the WP number and a sequential number denoting the page within the WP as shown below.

0002-1

Paragraphs are not numbered.

Primary paragraphs are denoted by headings set in **BOLD UPPER CASE (CAPITAL)** type.
Secondary and lower-level paragraphs are denoted by headings set in Bold Upper and Lower Case type. These paragraphs always relate to and are subordinate to the most recent primary paragraph heading.

Figures and tables are numbered sequentially within each WP starting with numeral 1

CHAPTER 1

OPERATOR INSTRUCTIONS

FOR

DC2E

MEDIUM XGA PROJECTION SYSTEM

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION
MEDIUM XGA PROJECTION SYSTEM
GENERAL INFORMATION

SCOPE

This Operators' and Maintenance Manual provides general information, instructions and procedures for setup, operation, teardown, maintenance, and repair of the Medium XGA Projection System components.

Configuration of the Medium XGA Projection System is shown in Figure 1.

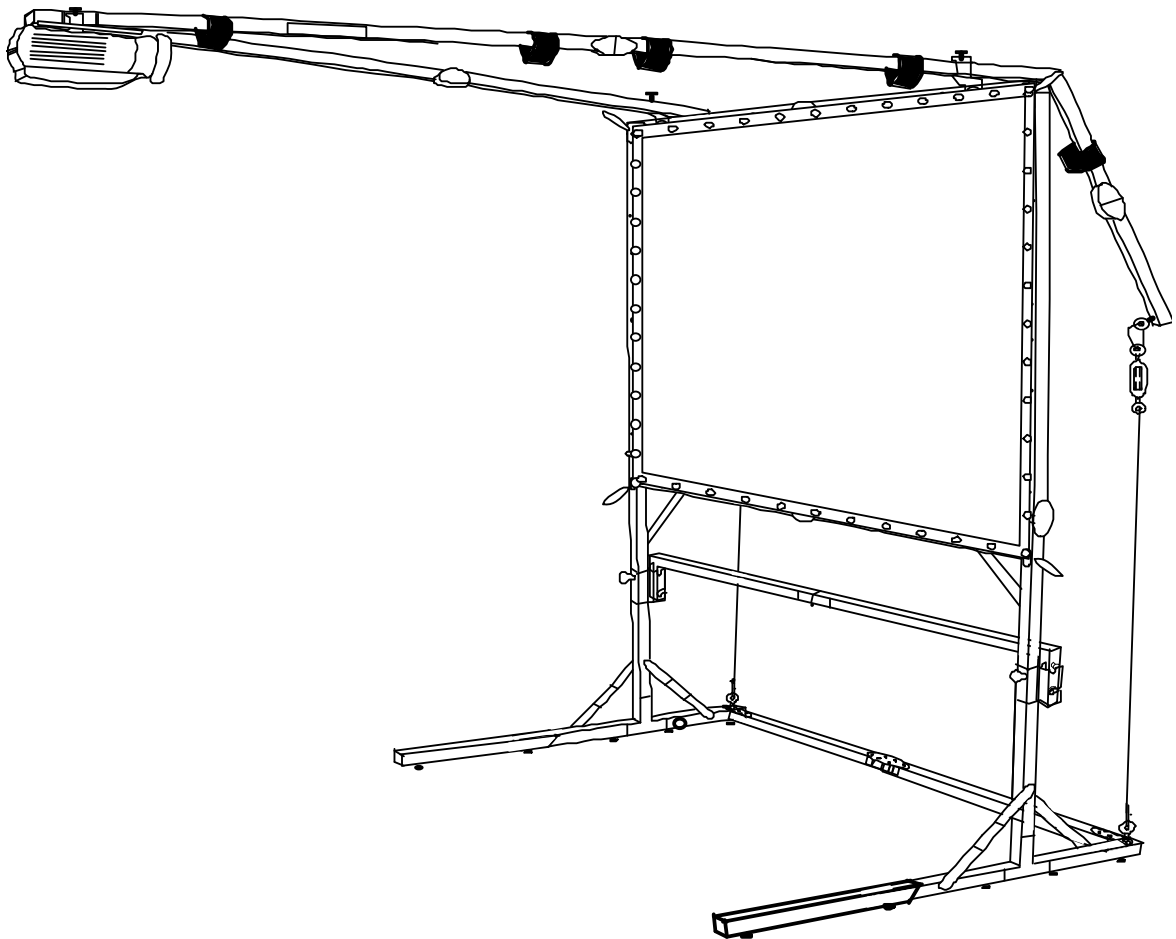


Figure 1. Medium XGA Projection System Configuration.

CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA PAM 25-30 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

MAINTENANCE FORMS, RECORDS, AND REPORTS

1. Reports of Maintenance and unsatisfactory Equipment. DA PAM 750-8. The Army Maintenance Management System (TAMMS) Users Manual, prescribes the DA forms and procedures used for equipment maintenance. Air Force personnel use AFR 66-1 for reporting maintenance and TO-00-35D54 for reporting unsatisfactory equipment. Navy personnel report maintenance performed utilizing the Maintenance Data Collection Subsystem (MDCS) in accordance with OPNAVINST 4790.2, Volume 3 and unsatisfactory material/conditions in accordance with OPNAVINST 4790.2, Volume 2, chapter 17. Marine Corps maintains forms and procedures as prescribed by TM 4700-15/1
2. Reporting of Item and Packaging Discrepancies. Fill out and forward SF 364, Supply Discrepancy Report (SDR) as prescribed in AR 735-11-2/DLAR 4140.55/SECNABINST 4355.18/AFR 400-54/MCO 4430.3J.
3. Reporting Transportation Discrepancies. Fill out and forward SF 361, Transportation Discrepancy Report (TDR), as prescribed in AR 55-38/NAVSUPINST 6410.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If the equipment needs improvement, let us know. Submit an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368, Product Quality Deficiency Report (PQDR). Mail it to: Technical Publications, DHS Systems, 33 Kings Highway, Orangeburg, New York 10962-1802. We'll send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army material is a continuing concern. It is important that any corrosion problems with the Large Screen Front Projection System be reported so that the problem can be corrected and improvements can be made to prevent future problems.

While corrosion is typically associated with rusting of metal, it can also include deterioration of other types of materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be considered a corrosion problem.

If a corrosion problem is identified, it shall be reported using SF 368, PQDR. Use of key words such as "corrosion," "rust," "deterioration," or "cracking" ensures the information is identified as a CPC problem.

The form should be submitted to: Technical Publications, DHS Systems, 33 Kings Highway, Orangeburg, New York 10962-1802. We'll send you a reply.

OZONE DEPLETING SUBSTANCES (ODS)

In accordance with Executive Order 12856, other public laws, DoD policy, and Army policy, the use of ODS has been banned for all new acquisitions. Operation and maintenance of the AVSS do not require the use of ODS.

DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

Procedures to destroy this equipment to prevent enemy use are in accordance with TM 750-244-2, Procedures for Destruction of Electronic Material to Prevent Enemy Use.

PREPARATION FOR STORAGE OR SHIPMENT

Place items in administrative storage for short periods of time when a shortage of maintenance resources exist. It should be possible to place items in a state of mission readiness either within 24 hours or within the time frame that the directing authority may determine. Keep appropriate maintenance records during storage.

Prior to placing the equipment in administrative storage, Army activities perform Preventative Maintenance Checks and Services (PMCS), complete Equipment Serviceability Criteria (ESC) evaluations, correct shortcomings and deficiencies, and complete all Modification Work Orders (MWO). When removing Items from administrative storage, the operator performs PMCS to ensure operational readiness.

Inside storage is preferred for items selected for administrative storage. If inside storage is not available, use trucks, vans, or other containers

WARRANTY INFORMATION

The Medium XGA Projection System has a limited 1 year warranty, with the following exceptions

- Deployable Command & Control Equipment Cables: 30 days
- Deployable Command & Control Equipment Lamps and Bulbs: 500 Hours/ 90 Days
- Deployable Command & Control Equipment Touch Panels: 90 Days

The warranty starts on the date found in block 23 of DA Form 2408-9, Equipment Control Record. If no DA 2408-9 is available, the date will be the recorded date of shipment of the equipment from the factory. Report all defects to the supervisor, who will take appropriate action. Contact the Regional Support Center (RSC) representative for further information on Warranty items.

NOMENCLATURE CROSS-REFERENCE LIST

Common names and/or abbreviations are used in the manual to make a procedure easier to read. Table 1 matches the official nomenclatures with the common names or abbreviations.

Table 1. Nomenclature Cross-Reference List.

OFFICIAL NOMENCLATURE	COMMON NAME or ABBREVIATIONS
Audio Visual Switching System	AVSS
Bayonet Neill-Concelman (Connector)	BNC (Connector)
Certified Technology Specialist	CTS
Certified Technology Specialist-Design	CTS-D
Certified Technology Specialist-Installation	CTS-I
Composite Video	CV
D-Subminiature 9-pin (Connector)	DB9 (Connector)
Data Circuit Terminating Equipment	DCE
Deployable Command & Control Equipment	DC2E
Dynamic Host Configuration Protocol	DHCP
Digital Light Processing	DLP
Electromagnetic Interface	EMI
Electrostatic Discharge	ESD
Front Projection Mode	FPM
High-Bandwidth digital Content Protection	HDCP
High-Definition Multimedia Interface (Connector)	HDMI (Connector)
HD15 (Connector)	High Density 15-pin (Connector)

Table 1. Nomenclature Cross-Reference List (Cont).

OFFICIAL NOMENCLATURE	COMMON NAME or ABBREVIATIONS
High-Definition Serial Digital Interface	HD-SDI
Internet Protocol	IP
J Series Front/Rear projection System	JSFRPS
Local Area Network	LAN
Medium Audio-Visual Switching System	AVSS-MED
Plain Old Telephone Service	POTS
Rear Projection Mode	RPM
Red, Green, Blue Sync	RGBS
Red, Green, Blue, Horizontal, Vertical	RGBHV
Red, sync on Green, Blue	RGsB
Radio Frequency Interface	RFI
Radio Corporation of America (Connector)	RCA (Connector)
Recommended Standard 232	RS232
Standard Definition	SD
Small Audio-Visual Switching System	AVSS-SMALL
Super Video Graphics Array	SVGA
Super Extended Graphics Array	SXGA
Transmission Control Protocol/Interface Protocol	TCP/IP
Video Graphics Array	VGA

COMMON VIDEO SIGNALS

Computer: The most common computer video resolutions today are 640 x 480 thru 1920 x 1200. The signal consists of red, green, blue, horizontal sync and vertical sync (RGBHV).

Composite: Composite video is the video format of an analog television signal before it is combined with sound and modulated onto an RF carrier. Composite video is the combination of luminance and chrominance on a single cable. This is typically the signal type you get from a camera or the “video out” on the back of a VCR or DVD. The most common formats used around the world are NTSC, PAL, or SECAM. NTSC is the US standard.

S-Video: S-Video means “Separate Video”. It is also called Y/C video. Y/C video is an analog signal that carries the video data (luminance and chrominance) as two separate signals.

COMMON VIDEO CONNECTORS

HD15: The common 15-pin VGA connector found on most video cards, computer monitors and other devices is almost universally called “HD-15”. HD stands for “high-density”, which distinguishes it from connectors having the same form factor but only two rows of pins. The HD connector has three rows of five pins.

BNC: The BNC connector is a type of RF connector used for terminating coaxial cable and is commonly used for video connections of both analog and SDI video type interfaces.

RCA: The RCA jack is a commonly used connector in audio/visual and can be used for both composite video and line level audio.

DB13W3: The DB13W3 is an analog video interface connector and can be converted into standard VGA connector using cables and adapters that are commonly available.

RJ-45: The RJ-45 is an eight-wire connector used commonly to connect computers onto a local-area networks (LAN) especially Ethernets.

COMMON AUDIO SIGNALS

Microphone Level: Microphone (MIC) level is a nominal signal coming directly from a microphone. Very low, in the microvolt's, and requires a preamp with at least 60 dB gain before using with any line-level equipment

Line Level: Line level is a term used to denote the strength of an audio signal used to transmit analog sound information between audio components such as CD and DVD players. Line level is a standard +4 dBu or -10dBV audio level.

Balanced Audio: A balanced audio signal requires two signal wires and one ground/shield wire. The two signal wires are of inverted polarity to each other. The two inverted signals along with an overall shield rejects outside noise over long cable distances.

Unbalanced Audio: An unbalanced audio signal requires two wires, one wire is for the +signal and the other wire is for ground or return. Unbalanced audio works fine for short distances, but is not recommended for long distances because it is more susceptible to outside noise interferences.

Mono Audio: Mono (Monaural) is a signal channel of sound. Mono is typically relating to a system of transmitting, recording, or reproducing sound in which one or more sources are connected to a signal channel.

Stereo Audio: Stereo (Stereophonic) sound is the reproduction of sound using two or more independent audio channels through a symmetrical configuration of loudspeakers in such a way as to create a natural impression of sound.

COMMON AUDIO CONNECTORS

XLR: The XLR connector is a rugged electrical connector design and the most common XLR is the 3-pin, used mostly for microphones and other balanced audio connections.

RCA Connector: The RCA jack is a commonly used connector in audio/visual and can be used for both line level audio and composite video.

1/8" TRS: TRS stands for Tip, Ring & Sleeve and is used to pass stereo audios three signals (left, right and ground) from a speaker connection to a sound card on a PC.

1/4" TRS: Is the original "jack-like plug" and is the same as the 1/8" TRS, except for size.

VIDEO DISTRIBUTION METHODS

HD15: HD15 cables are the most common way of sending computer video from a computer to monitors or display types.

CAT5: CAT5 or UTP is a typical 8-wire cable is another popular method for sending computer video over long distances.

Wireless: The wireless transmission of computer video signals is often a packet loss problem as well as the security concerns attached. Also, band-width limitations reduce the resolutions and frames per second transmitted. Wireless is not recommended for full motion high resolution video.

LIST OF ABBREVIATIONS/ACRONYMS

Abbreviation/Acronym	Name
AC	Alternating Current
AVSS	Audio Visual Switching System
BII	Basic Issue Items
BTU	British Thermal Unit
CAGEC	Commercial and Government Entity Code
CB	Circuit Breaker
CCS	Command Center System
COEI	Components of End Item
COP	Common Operational Picture
COTS	Commercial off The Shelf
CP	Command Post
CPC	Corrosion Prevention and Control
D	Depot
DC2E	Digital Command and Control Equipment
DMR	Depot Mobilization Requirements
DS	Direct Support
EIR	Equipment Improvement Recommendations
ESC	Equipment Serviceability Criteria
FGC	Functional Group Code
FM	Field Manual
FO	Foldouts
GS	General Support
HDBK	Handbook
HMMWV	High Mobility Multi-Purpose Wheeled Vehicle
HVAC	Heating, Ventilating and Air Conditioning
I/O	Input/Output
LED	Light Emitting Diode
MAC	Maintenance Allocation Chart
MOS	Military Occupational Specialties
MWO	Modification Work Order
NSN	National Stock Number
PDP	Power Distribution Panel
PMCS	Preventive Maintenance Checks and Services
PQDR	Product Quality Deficiency Report
PSI	Pounds per Square Inch
P/N	Part Number
QA	Quality Assurance
RPSTL	Repair Parts and Special Tools List
SDR	Supply Discrepancy Report
SIMPL	Symbol Intensive Master Programming Language
SMR	Source, Maintenance and Recoverability
SOP	Standing Operating Procedure
TAMMS	Army Maintenance Management System
TB	Troubleshooting
TDR	Transportation Discrepancy Report
TMDE	Test, Measurement, and Diagnostic Equipment
TMSS	Trailer Mounted Support System
U/I	Unit of Issue
UPS	Uninterruptible Power Supply
VAC	Voltage, Alternating Current
WP	Work Package

QUALITY OF MATERIAL**Part Number: 1006379****0001-6****DHS Systems LLC**

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Material used for replacement, repair, or modification must meet requirements of this Operator and Unit Maintenance Manual. If quality of material requirements is not stated in this Operator and Unit Maintenance Manual, material must meet the requirements of drawings, standards, specifications, or approved engineering change proposals applicable to subject equipment.

SAFETY, CARE, AND HANDLING

To prevent personal injury and damage to equipment, obey the following general rules and precautions:

1. Become familiar with warnings and cautions listed in front of this manual.
 - a. Warnings – Present circumstances or procedures which, if not strictly adhered to, may cause injury or death.
 - b. Cautions – Present circumstances which can cause damage to equipment or loss of mission.
2. Recognize equipment may require at least a two-person carry. Follow number of lifter/requirements in safety marking (labels or stencils) and caution statements in Technical Documentation. No rights are conveyed except as indicated in the legend on the cover of this document.
3. Ensure all power is turned off before starting any removal task.
4. Do not touch connector terminals with any tool, bare hands, or dirty cloth. Tools damage the connector. Dirt or sweat will cause corrosion.
5. Before touching any electrical component, discharge static electricity by touching a metal chassis or cabinet.. A static discharge to an electrical component can destroy internal circuits.
6. Know where emergency equipment is located. Read instructions on fire extinguisher label.
7. Ensure hands are clean before working on equipment.

NUCLEAR HARDNESS

There is no Hardness Critical Procedures (HCP) in this manual.

CALIBRATION

All equipment requiring calibration shall be done in accordance with TB 43-180.

GROUNDING

Refer to CECOM TR-98-6 for proper grounding instructions.

END OF WORK PACKAGE

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION
MEDIUM XGA PROJECTION SYSTEM
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

The following items are referred to as assemblies throughout this manual to describe the deployment of this equipment:

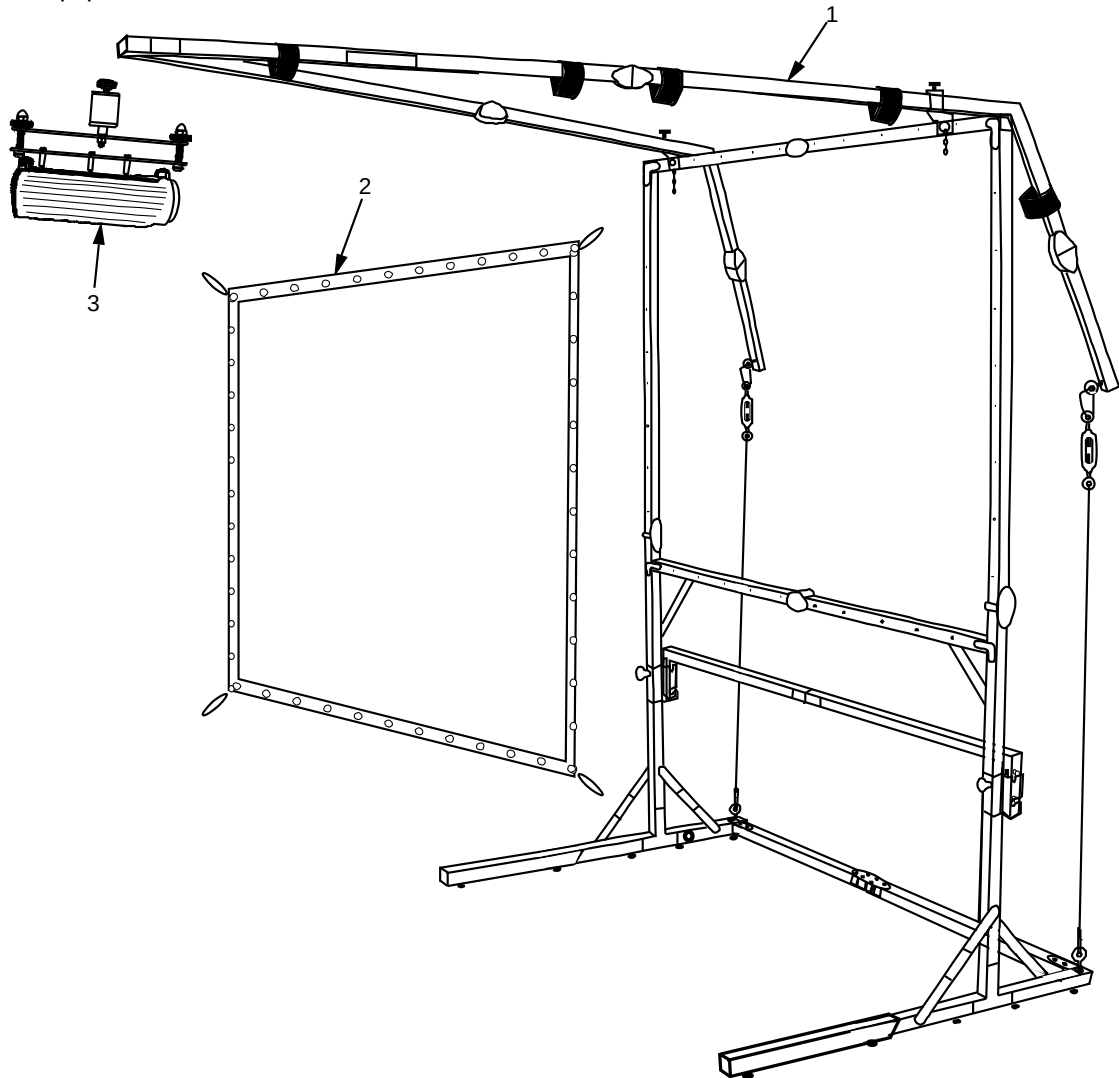


Figure 1. Major Components, Medium XGA Projection Configuration.

Table 1. Major Components, Medium XGA Projection Configuration.

ITEM	ASSEMBLY	FUNCTION
1	Assembly, Frame	All components to secure Screen in proper operating position.
2	Assembly, Screen	All components to hold Screen material without folds or ripples.
3	Assembly, Projector	All components needed to secure Projector to frame assembly.

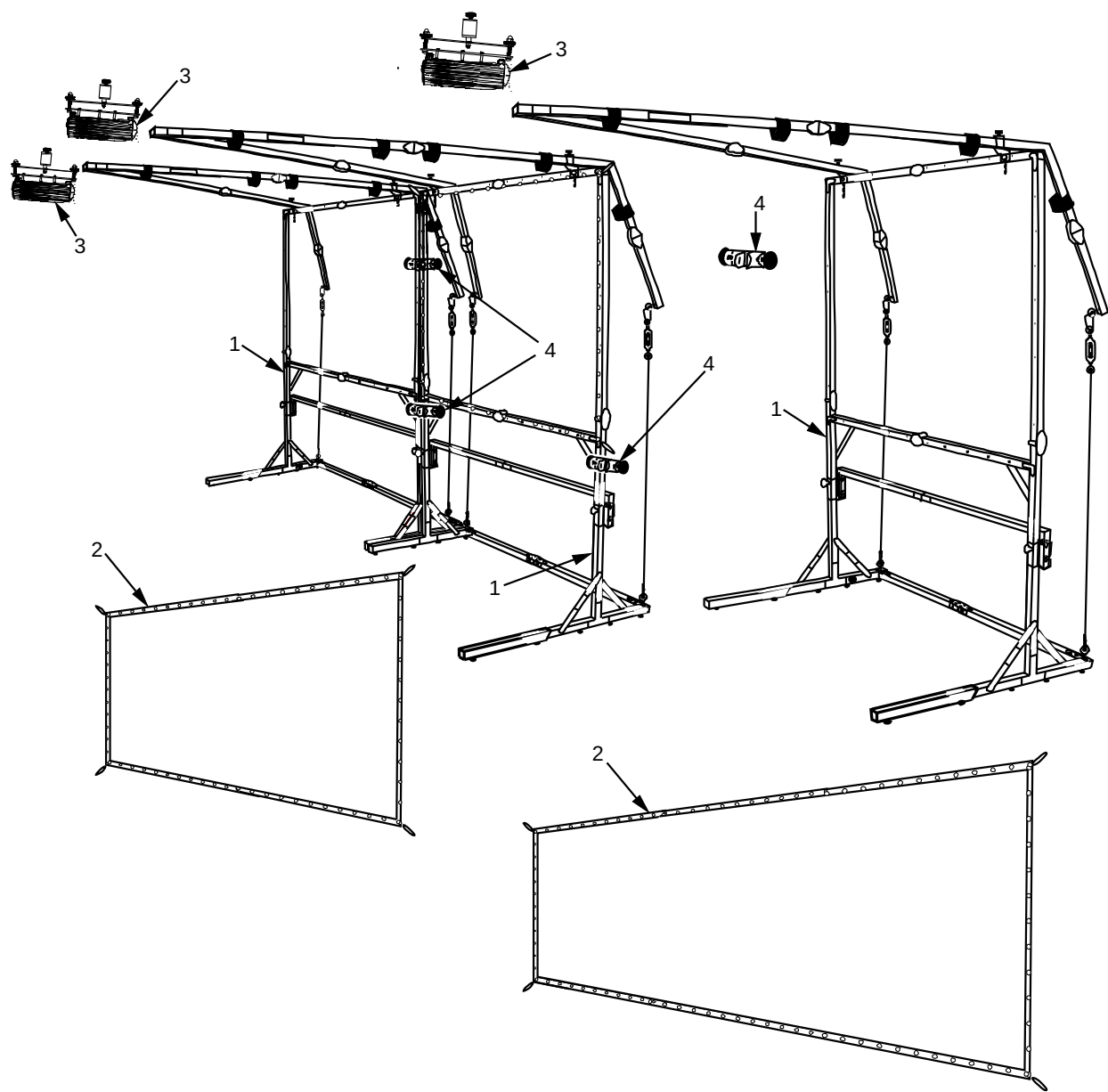


Figure 2. Major Components, Multiple Screen Configurations.

Table 2. Major Components, Multiple Screen Configurations.

ITEM	ASSEMBLY	FUNCTION
1	Assembly, Frame	All components to secure Screen in proper operating position.
2	Assembly, Screen	All components to hold Screen material without folds or ripples.
3	Assembly, Projector	All components needed to secure Projector to frame assembly.
4	Clamp, Deluxe Straight Joining	Component required securing multiple screen configurations together.

END OF WORK PACKAGE

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, and THEORY of OPERATION
MEDIUM XGA PROJECTION SYSTEM
THEORY OF OPERATION

GENERAL

The following WP identifies the theory of operation for the Medium XGA Projection System. This system consists of video components designed to support various operations and a wide range of signal compatibility.

Designed to fit into a medium Deployable Rapid Assembly Shelter (DRASH), the entry level DC2E Medium XGA Projection System features a DLP projector that accepts and displays images with a resolution of up to 1280 x 1024. Multiple screens can connect together to form a single, large screen. Its unique design of a cantilevered projector mounting arm preserves valuable floor space.

Viewing area measures from a single screen display of 59" x 44" x 73" diagonal to a triple screen display of 59" x 132" x 73" diagonal.

Despite its numerous capabilities, the Medium XGA Projection System is compactly stored in two separate wheeled cases for easy transport.

FEATURES:

- Native resolution 1024 x 768 (XGA) resolutions. System accepts and displays images with a resolution of up to 1280 x 1024.
- Wide range of signal compatibility.
- Viewing area measures 59" x 44" x 73" diagonal.
- Projectors weigh only 5.5 lbs (2.5 kg) and have a low noise level of 30 dB (A).
- Ability to display 16.7 million colors.
- Switchable normal and economic modes to reduce the power consumption.
- 185 Watts, high brightness projection lamp.
- Power supply – AC100-240V, 2.9A, 50/60 Hz
- 3000/4000 hour lamp life, multi-voltage 2500 ANSI lumens.
- Lightweight 1" square tube aluminum frame system with locking hinge points for fast set up and take down. Includes adjustable rubber feet for uneven terrain.
- Fully sealed optical architecture ensures faultless operation in harsh environments.
- Cantilevered projector mounting arm preserves valuable floor space.
- Integrated mounting points for shelter loudspeakers allow for high quality audio.
- Multiple projection screens connect together to form a single screen.

END OF WORK PACKAGE

CHAPTER 2

OPERATOR INSTRUCTIONS

FOR

DC2E

MEDIUM XGA PROJECTION SYSTEM

OPERATOR INSTRUCTIONS
MEDIUM XGA PROJECTION SYSTEM
DESCRIPTION AND USE OF OPERATOR CONTROLS, INDICATORS AND CONNECTIONS

GENERAL

This work package contains illustrations and tables that describe location and function of the projector's keypad, rear control panel connections and remote control used for operation of Medium XGA Projection System.

PROJECTOR KEYPAD

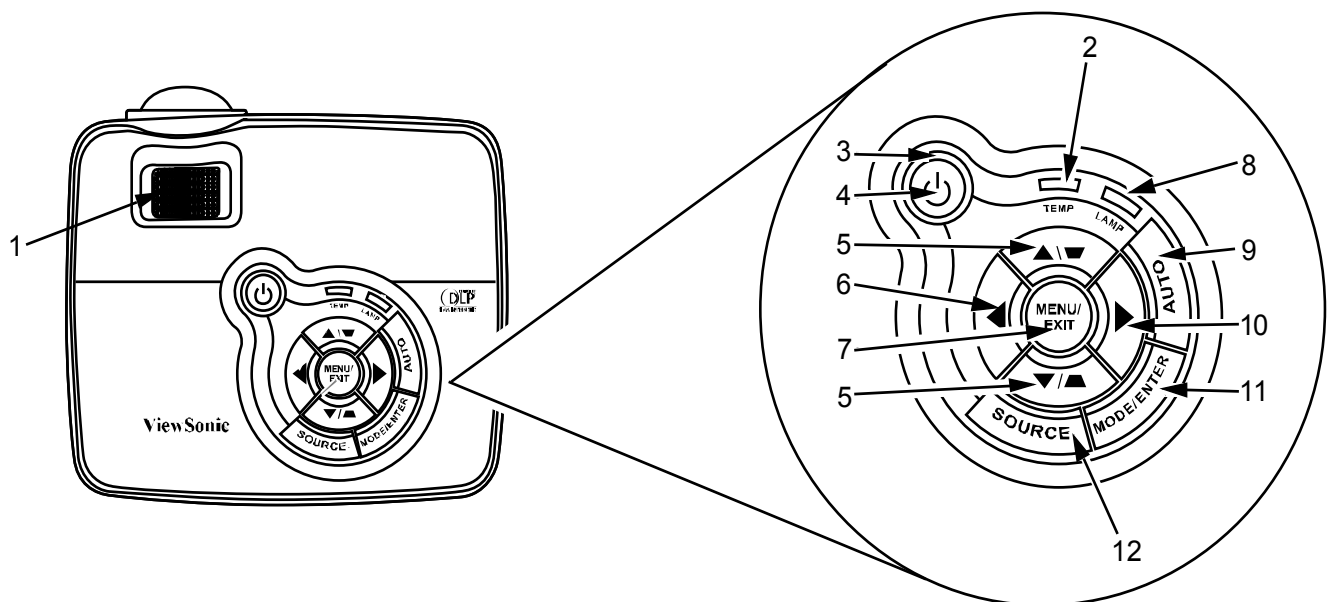


Figure 1. Projector, Top Panel – Keypad Functions.

Table 1. Projector, Top Panel – Keypad Functions.

ITEM	CONTROLS, INDICATORS AND CONNECTIONS	FUNCTION
1	FOCUS RING	Adjusts the focus of the projected image.
2	TEMPERATURE Indicator Light	Lights up RED if the projector's temperature becomes too high.
3	POWER Indicator Light	Lights up or flashes when projector is under operation.
4	 POWER	Toggles the projector between standby mode and on.
5	KEYSTONE/ARROW KEYS  /  (UP) /  /  (DOWN)	Manually corrects distorted images resulting from an angled projection.
6	 LEFT / BLANK	Hides the screen picture.
7	MENU / EXIT	Turns ON the On-Screen Display (OSD) menu. Goes back to previous OSD menu, exits, and saves menu settings.
8	LAMP Indicator Light	Indicates the status of the lamp. Lights up or flashes when the lamp has developed a problem.
9	AUTO	Automatically determines the best picture timings for the displayed image.
10	 Right / 	Activates panel key lock. (When OSD menu is activated, the #5, #6, and #10 keys are used as directional arrows to select the desired menu items and to make adjustments).
11	MODE / ENTER	Selects an available picture setup mode.
12	SOURCE	Displays the source selection bar.

PROJECTOR REAR PANEL

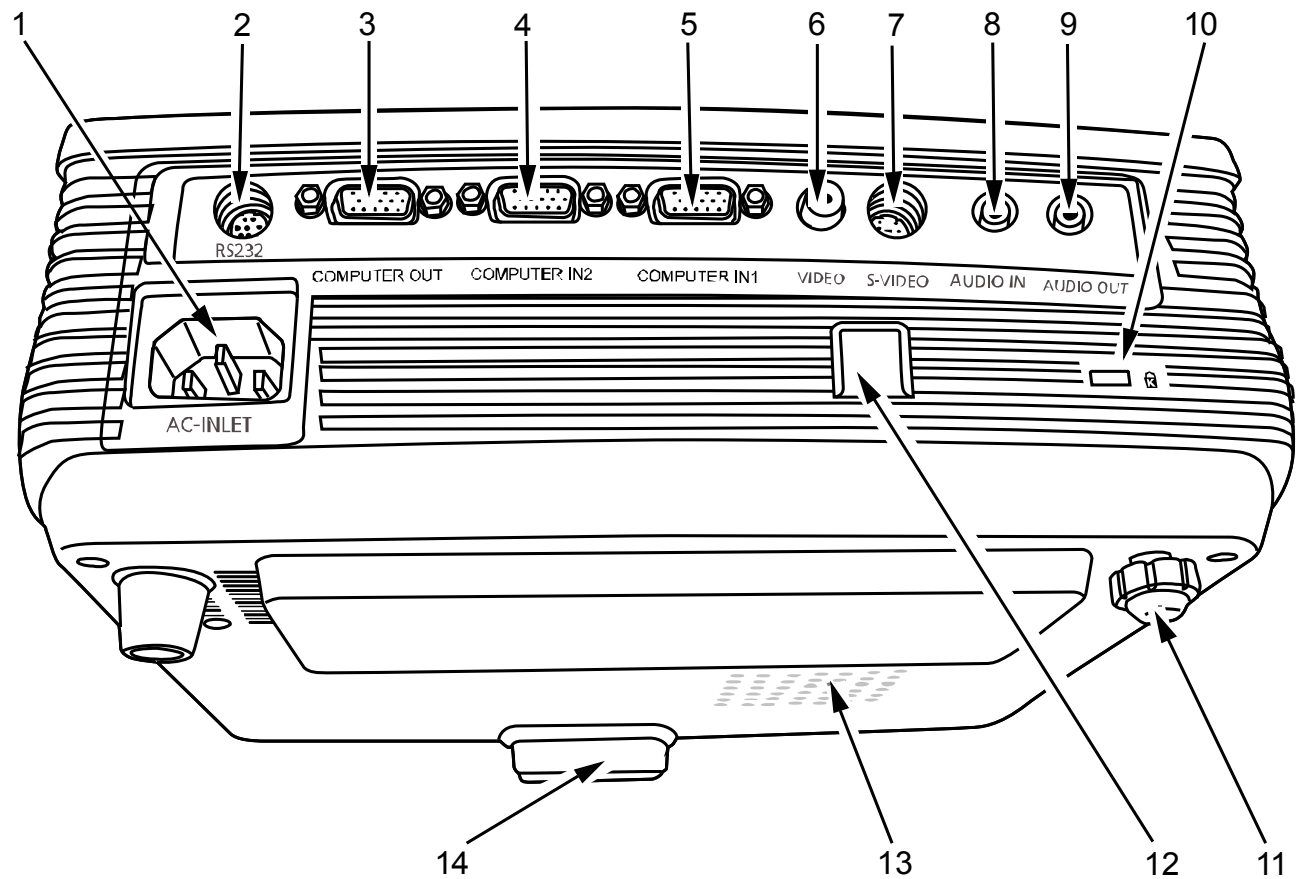


Figure 2. Projector Rear Panel.

Table 2. Projector Rear Panel.

ITEM	CONTROLS, INDICATORS AND CONNECTIONS	FUNCTION
1	AC POWER CORD INLET	Use only three-prong/grounded power cord.
2	RS-232 CONTROL PORT	Allows for wired remote control and monitoring of many projector functions used in installation environments.
3	RGB SIGNAL OUTPUT SOCKET	For a low noise computer and video image.
4	RGB (PC)/COMPONENT VIDEO -1	The standard analog computer graphics interface.
5	RGB (PC)/COMPONENT VIDEO -2	The standard analog computer graphics interface.
6	VIDEO INPUT SOCKET	Used for standard video quality.
7	S-VIDEO INPUT	Analog signal used for improved quality video.
8	AUDIO SIGNAL INPUT SOCKET	Audio in from source.
9	AUDIO SIGNAL OUTPUT SOCKET	Audio out to speakers.
10	ANTI-THEFT LOCK SLOT	
11	REAR ADJUSTER FOOT	
12	SECURITY BAR	Connects a commercially available theft prevention cable.
13	LAMP COVER	Secures lamp assembly.
14	QUICK-RELEASE FOOT	

REMOTE CONTROL KEYPAD

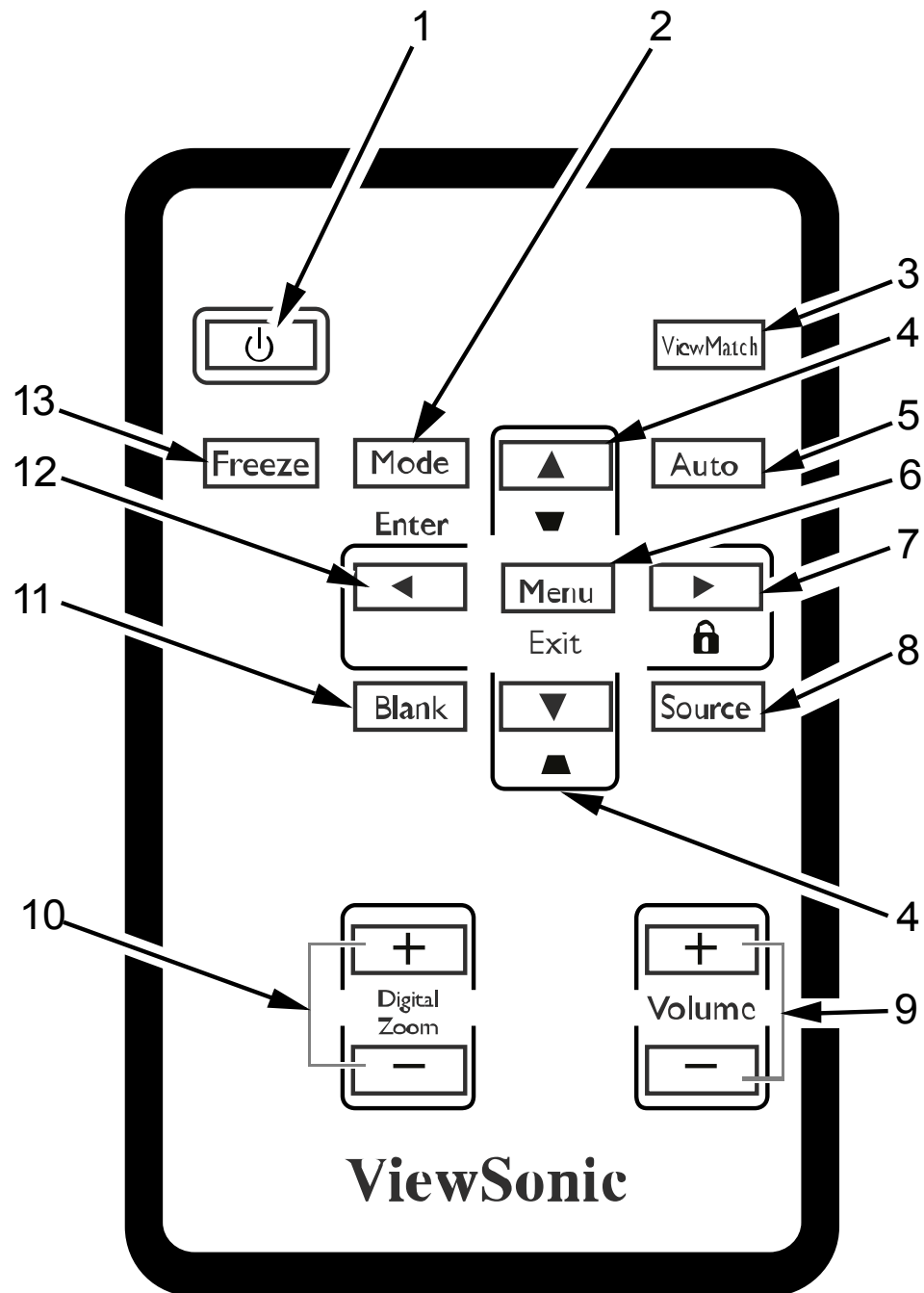


Figure 3. Remote Control, Keypad.

Table 3. Remote Control, Keypad.

ITEM	CONTROLS, INDICATORS AND CONNECTIONS	FUNCTION
1	 POWER	Toggles the projector between standby mode and ON.
2	MODE / ENTER	Selects an available picture setup mode.
3	VIEW MATCH	Switch in between high brightness performance or Accuracy color performance.
4	KEYSTONE/ARROW KEYS  /  (UP) /  /  (DOWN)	Manually corrects distorted images resulting from an angled projection.
5	AUTO	Automatically determines the best picture timings for the displayed image.
6	MENU / EXIT	Turns ON the On-Screen Display (OSD) menu. Goes back to previous OSD menu, exits, and saves menu settings.
7	 RIGHT / 	Activates panel key lock. (When OSD menu is activated, the #5, #6, and #10 keys are used as directional arrows to select the desired menu items and to make adjustments).
8	SOURCE	Displays the source selection bar.
9	VOLUME KEYS (+, -)	Magnifies or reduces the volume level.
10	DIGITAL ZOOM (+, -)	Magnifies or reduces the projected image size.
11	BLANK	Hides the screen image.
12	 LEFT	Selects the desired menu items and makes adjustments.
13	FREEZE	Freezes the projected image.

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS
MEDIUM XGA PROJECTION SYSTEM
MEDIUM XGA PROJECTION SYSTEM SET-UP/TAKE-DOWN PROCEDURES

GENERAL

This Work Package details site selection, setup, and initial power-up procedures of the DC2E Medium XGA Projection System. It also covers power-down, disassembly, and storing of system.

SITE REQUIREMENTS

To ensure minimal problems and good operation of the Medium XGA Projection System, ensure area is:

- Dry
- Level with minimum clearing of 6 feet (1.8 m) wide by 88 inches (2.2 m) high by 8 feet (2.4 m) deep for deployment and operation (see Figure 1).
- Free of any obstructions that would interfere with the truss or screen sections.

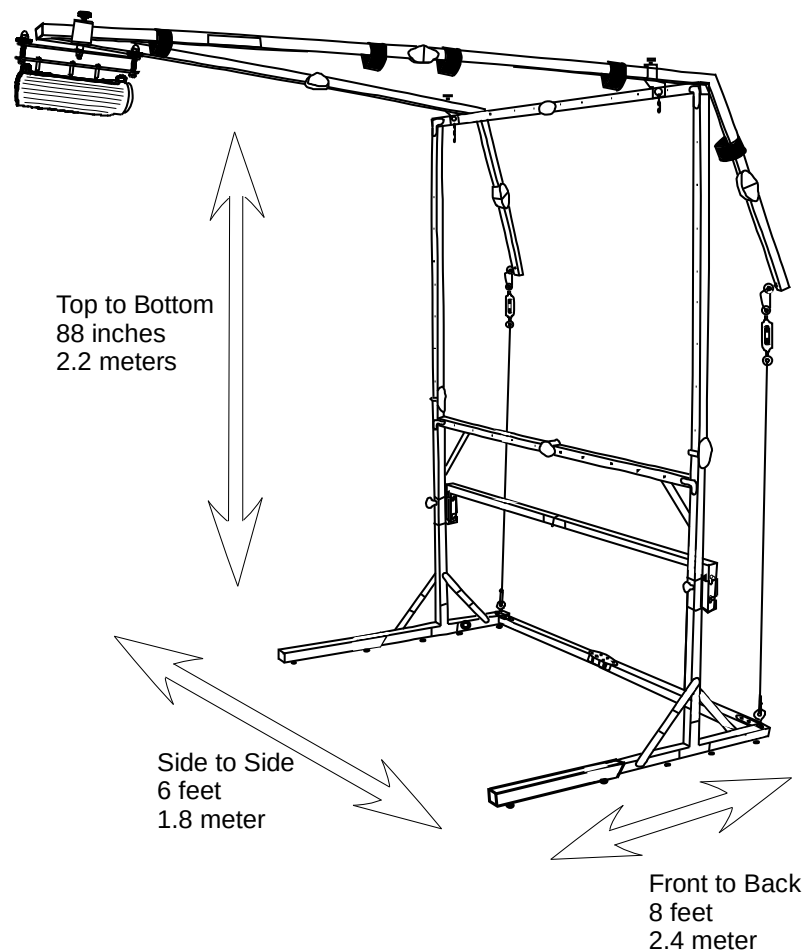


Figure 1. Site Requirements for Medium XGA Projection System.

MEDIUM XGA FRAME ASSEMBLY PROCEDURES

WARNING

The screen surface must be stored in its pouch when not in use to prevent damages. If stored at temperatures far below room temperatures, allow the screen to warm up to room temperature before unfolding. This will ensure the film is being handled in its most flexible state and will prevent surface cracks.

WARNING

There are seventeen pivot (pinch) points located around the frame assembly.

ASSEMBLE FRAME

1. Locate and place both transport cases in the area where the Medium XGA Display is to be setup.
2. Open the transport case that contains the frame components and unload contents onto ground in work area.
3. Expand screen frame (1) to open position. Ensure frame hinges and corner support braces are securely latched as shown in Figure 1.
4. Extend four folding legs of frame (2). Ensure folding leg support braces (3) are locked (see Figure 2).
5. Use the rubber feet (4) on the folding legs (2) of screen frame (1) to compensate for uneven floor surface.

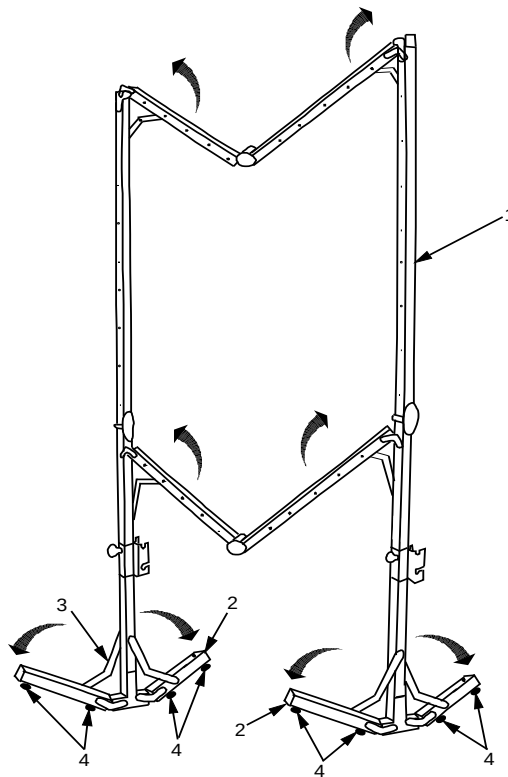


Figure 2. Expand Screen Frame.

ASSEMBLE FRAME CONTINUED

6. Secure the upper support crossbar (5) to the screen frame (1) by placing each side in position and tapping down to seat the brace rivets into the respective brackets. Seat both sides of the upper brace into the brackets uniformly to prevent binding (see Figure 3).
7. Secure the lower support crossbar (6) to the screen frame (1) by removing the eye bolts (7) on each side of the screen frame (1), placing the lower support crossbar (6) into position, and replacing the two eye bolts (7) (see Figure 2).

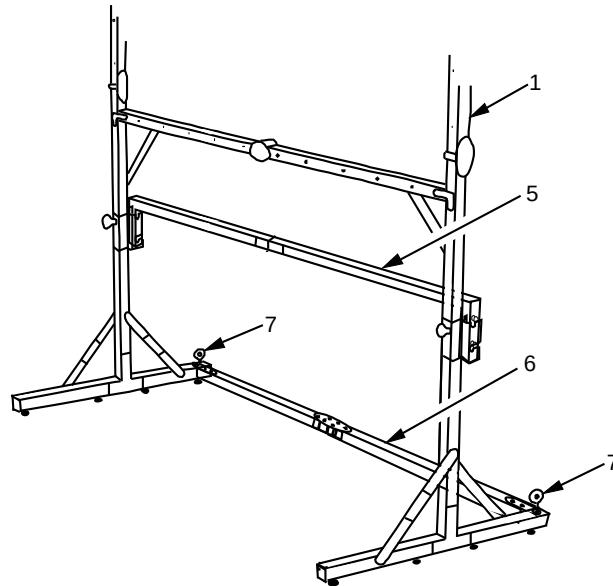


Figure 3. Install Upper and Lower Support Crossbar.

SCREEN SYSTEM COUNTERBALANCE

One of three methods should be used to prevent the screen system from tipping forward from the weight of the projector.

8. Two extension legs (8) are provided and can be attached to the front two feet of the screen frame (1) as shown in Figure 4. Slide extension legs over existing forward legs.

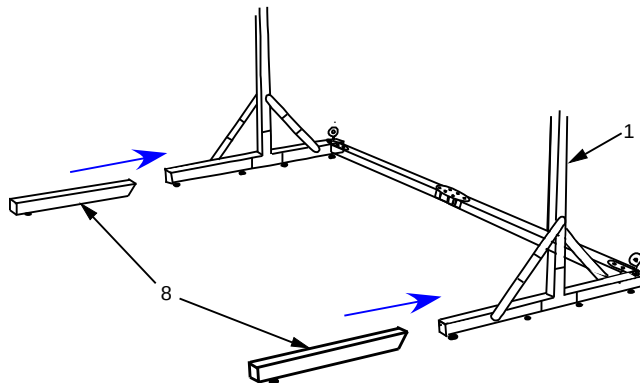


Figure 4. Counterbalance Frame with Extension Legs.

SCREEN SYSTEM COUNTERBALANCE (Cont)

9. A counterweight, such as three sandbags or 100 lbs of weight can be placed over the lower crossbar (6) that extends between the rear legs of the screen frame assembly (1) as shown in Figure 5.

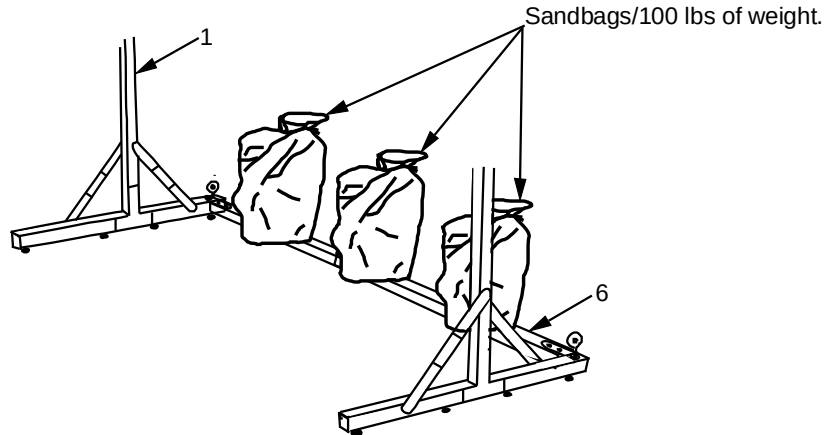


Figure 5. Counterbalance Frame with Sandbags.

10. Two ratcheting tie downs (9) are provided with the system. The top rear of the screen frame assembly has two eye-bolts (10) inserted to provide attachment points for the tie downs as shown in Figure 6. The tie downs (9) are connected to each eye-bolt (10) and then to looped keepers located at the base of the DRASH Shelter.

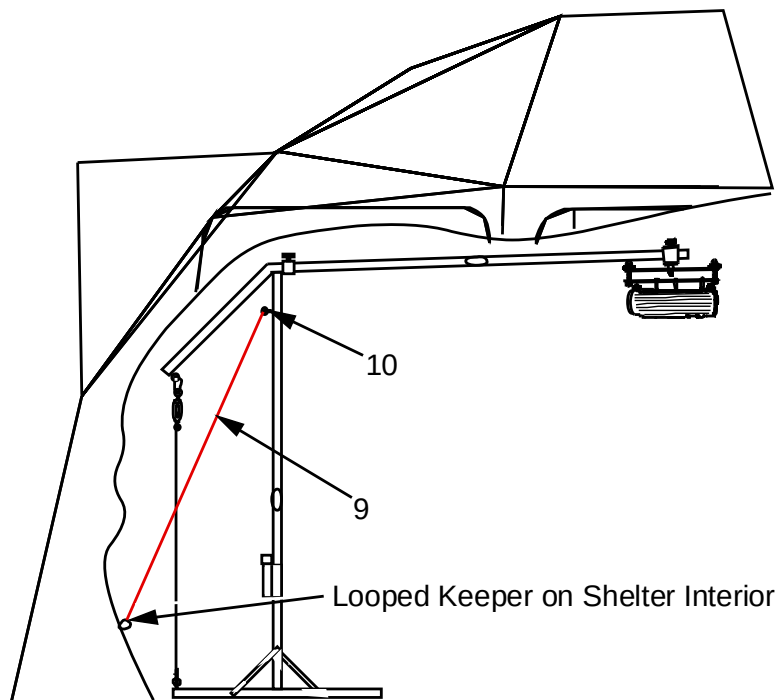


Figure 6. Secure Frame to Shelter.

ATTACH PROJECTOR SUPPORT ARM

11. Each hinged clamp (10) has one clamp welded that does not rotate and one clamp secured in a way that allows it to rotate. The side of the hinge that has the clamp that does not rotate must be mounted to the screen frame (1). The side of the hinge with the rotating clamp must be attached to the projector support arm. Secure the two hinge clamps (10) to the marked positions on the upper rail of the screen frame (1).

NOTE

If the hinged clamp has a chain, it must be on the back side of the screen frame rail (opposite the screen mount side).

12. Expand the projector support arm and ensure all hinges are securely latched. Secure one side of the Projector Support Arm (11) to a rotating hinged clamp (10) using the marked position on the similar side of the projector support arm rail (11). Extend the Projector Support Arm (11) sideways and secure the second projector support arm rail (11) to the second rotating clamp (10) (see Figure 7).
13. Secure the two adjustable steel cables (12) to the two eye bolts on back of the projector support arm rails (11) with the turnbuckles closest to the projector support arm eye bolts. This allows for better adjustment accessibility in later steps.
14. Secure the two adjustable steel cables (12) to the two eye bolts (7) (see Figure 3) on the rear legs of the screen frame.

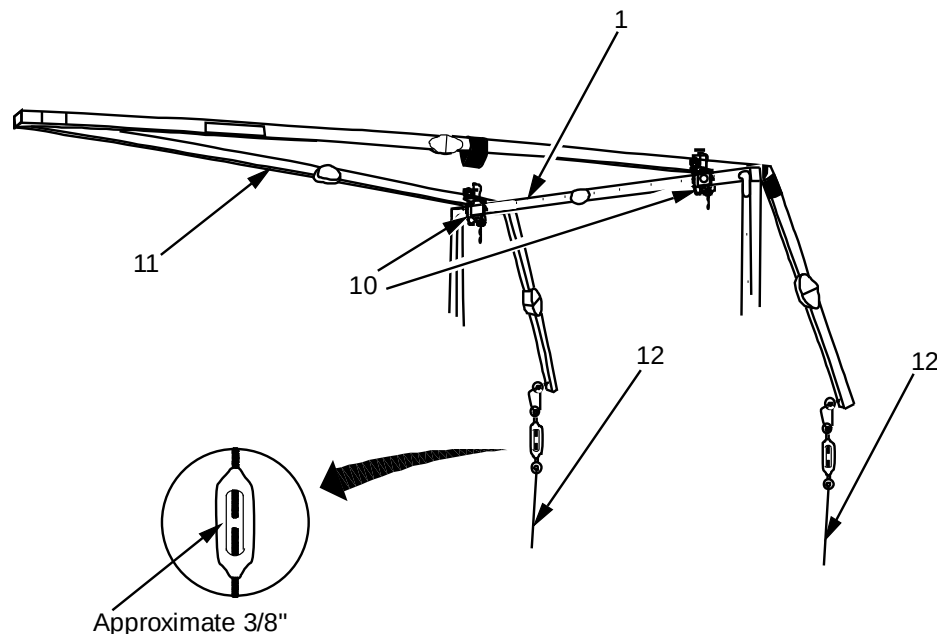


Figure 7. Attach Projector Support Arm and Hinged Clamps.

WARNING

Ensure the eye bolts are securely fastened or they could rotate out when performing adjustments and cause the projector support arm and projector to fall.

15. Adjust the steel cable (12) turnbuckles so that the spacing between the ends of the threaded eye bolts as viewed through the turnbuckle is approximately 3/8 inch as shown in Figure 7. This speeds image adjustment later by placing the gap close to where it should be.

LOCK FRAME ASSEMBLY**WARNING**

There are seventeen pivot points around the frame assembly that must be secured in their locked position.

16. Manually inspect all of the pivot points around the frame assembly shown in Figure 8 to verify that they are in the locked position.

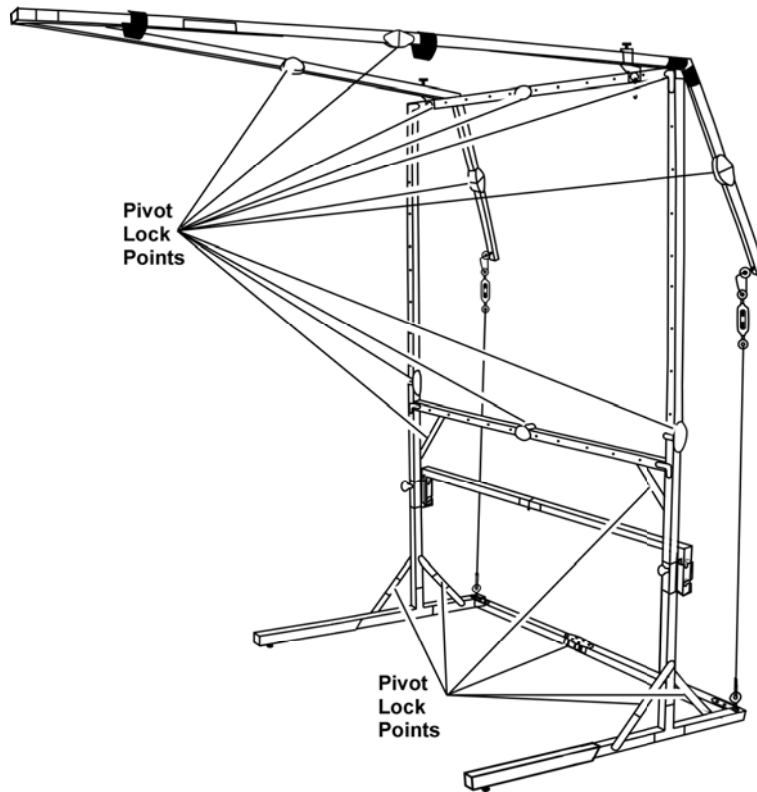


Figure 8. Frame Assembly Locked Points.

ATTACH SCREEN TO FRAME ASSEMBLY**WARNING**

Allow the screen to warm up to room temperature (68°F/20°C) before unfolding. This will ensure the screen is being handled in its most flexible state and will prevent surface cracks.

CAUTION

Gloves, if worn, should be removed and hands should be clean for the following procedure. Equipment damage can result if screen is soiled.

17. Locate and remove the projector screen from its protective pouch.
18. Unfold the screen and orient the snaps on rear of screen to the snaps on the frame assembly.

ATTACH SCREEN TO FRAME ASSEMBLY (Cont)

19. Starting at either upper screen corner, secure one upper corner snap (A) on the screen to the corresponding snap stud on the frame assembly (1) as shown in Figure 9.
20. Secure one snap (A) on either side of the upper corner snap to the corresponding snap studs on the frame assembly (1).
21. Place one thumb in one of the lower screen loops (B) and pull gently outwards.
22. Secure the lower corner snap on the screen (A) to the corresponding snap studs on the frame assembly (1).
23. Secure the opposite lower corner snap (A) on the screen to the corresponding snap on the frame assembly (1).
24. Secure the remaining snaps (A) to their corresponding snap studs on the frame assembly (1).

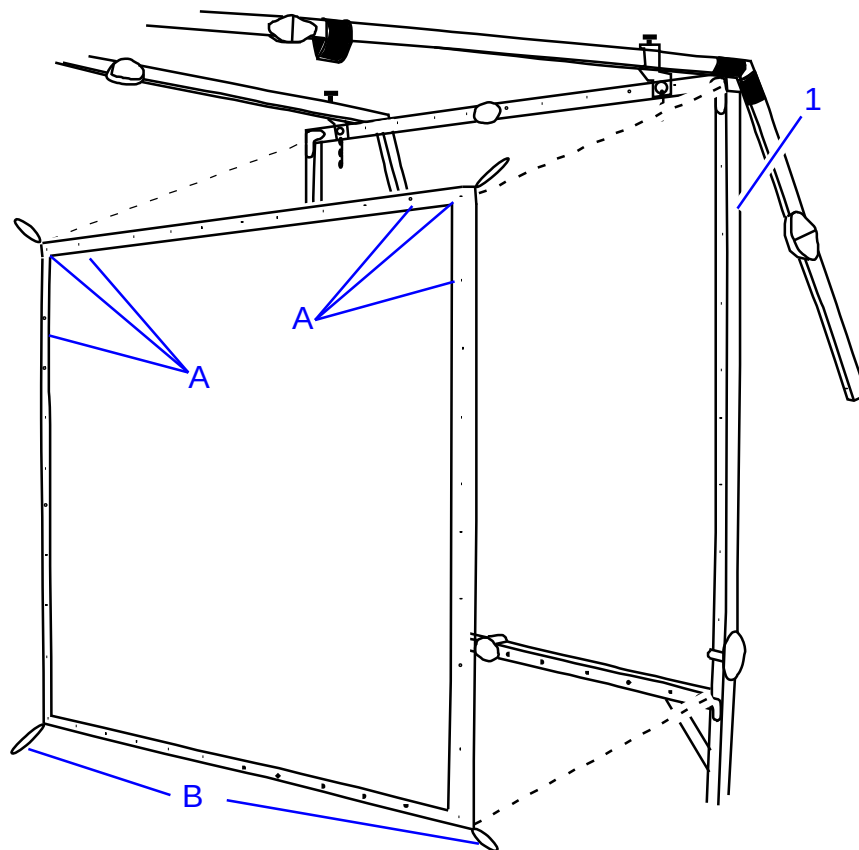


Figure 9. Attach Screen to Frame.

ATTACH PROJECTOR TO FRAME SUPPORT ARM**NOTE**

Mounting plate is already attached to the projector at the factory. If the mounting plate has been removed, attach the mounting plate to the projector using a #2 Philips screwdriver.

25. Secure the projector mounting bracket (13) to the projector (14) by turning the three Phillips head screws into the projector mounting holes six - 360 degree (full) turns of a Phillips #2 screwdriver or no more than 8mm/.3in. Take care not to cross thread the screws into the holes.

WARNING

DO NOT insert screws more than specified - may result in projector damage.

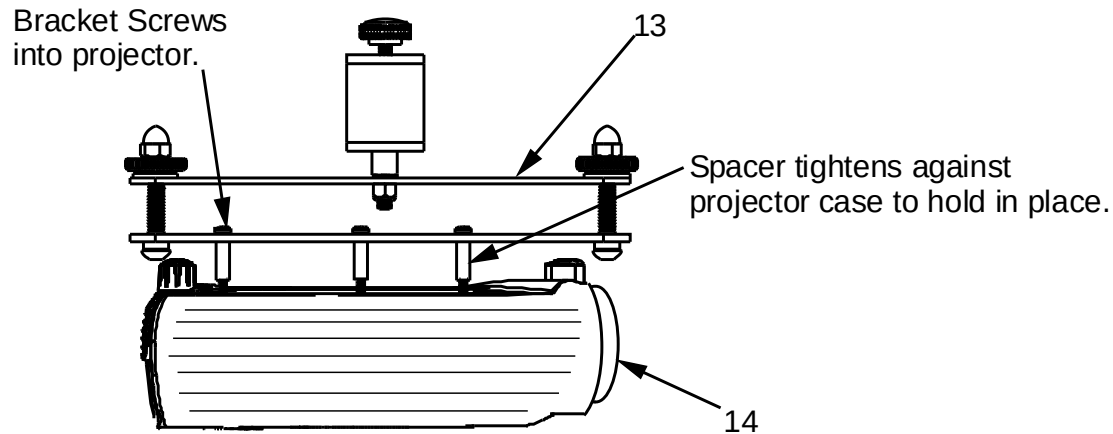
Side view

Figure 10. Attach Mounting Plate to Projector.

ATTACH PROJECTOR TO FRAME SUPPORT ARM (Cont)

26. Secure the projector assembly to the projector support arm at the marked location toward the "V" joint of the arm with the clamp on the projector mount. Ensure the raised edge on the lower portion of the clamp wraps completely around the projector support arm to prevent the clamp from coming loose.
27. Attach power and video cables to Velcro straps (15) on projector support arm (11) (see Figure 11).
28. Attach power and video cable to projector.

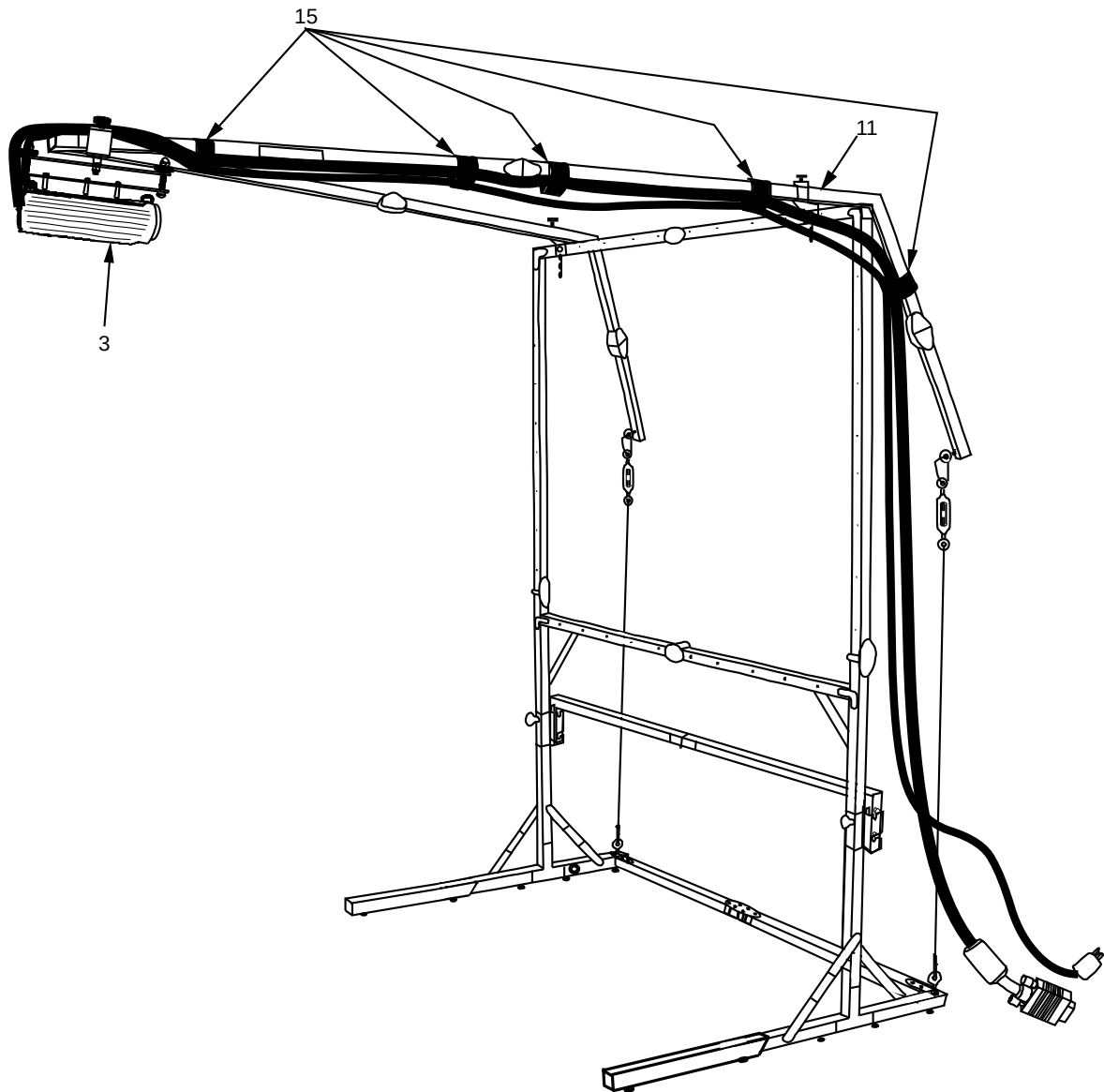


Figure 11. Attaching Power and Video Cables.

JOINING MULTIPLE SCREENS TOGETHER

Refer to WP 0006 for procedures on joining multiple screens together.

OPTIONAL PROJECTOR COOLING SYSTEM KIT

The projector cooling system kit consists of a DRASH shelter plenum, projector cooling sleeve, and corrugated hose. The cooling system should be used when ambient temperatures reach 80°F (27°C). Also when used the system prevents excessive dust from entering the projector. See Figure 12 for layout configuration.

WARNING

Cool air must be flowing prior to operating a projector sealed in a projector sleeve. Projector sleeve screened opening must be aligned with the exhaust port of the projector or the projector will shut down due to overheating.

29. Install the DRASH shelter plenum into the shelter so that there are minimum bends and a plenum exhaust port aligns with the projector location. Connect the plenum to the air supply duct of the ECU entering the shelter.
30. Remove the mount from the projector, if installed, and install the projector sleeve onto the projector aligning the hole for the lens and mounting holes. Cinch the sleeve opening around the neck of the projector lens, close to the projector body. Do not over tighten. Install the projector mount through the holes in the sleeve as described in the "Attach Projector to Frame" Section of this manual.
31. After installing the projector, with cooling sleeve, onto the screen frame you should attach the corrugated hose from the port located on the projector sleeve to a closely located port on the shelter plenum and cinch these ports securely onto the corrugated hose.

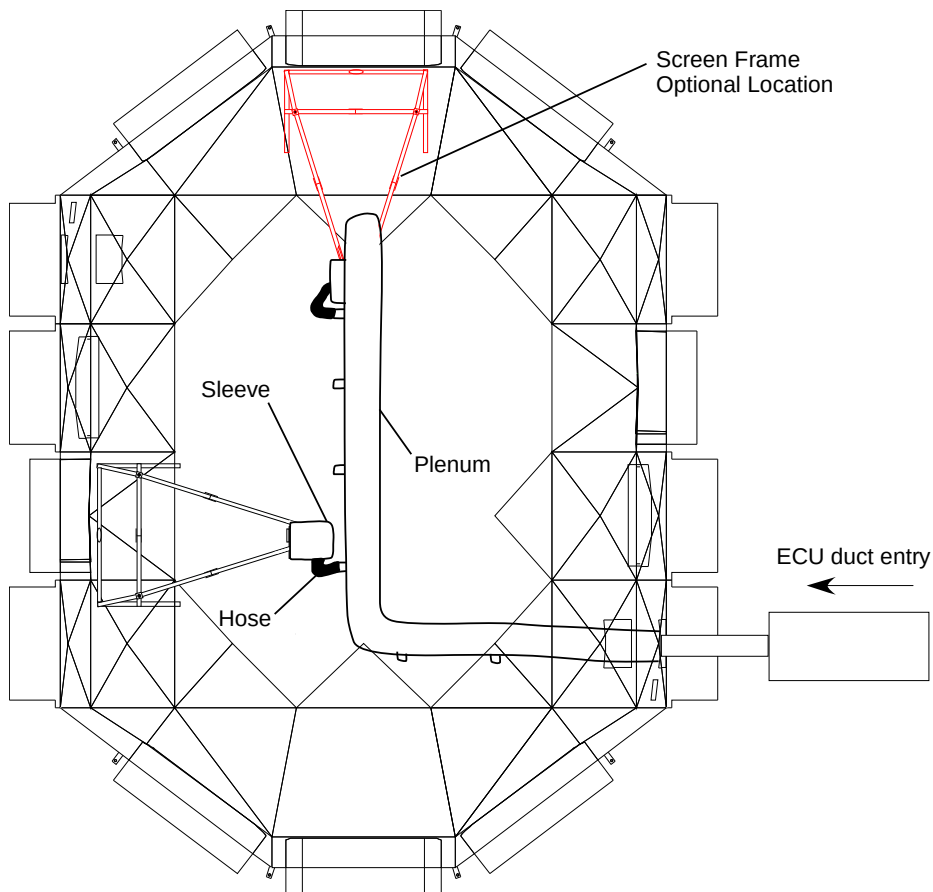


Figure 12. Projector Cooling System Configuration.

FRAME DISASSEMBLY PROCEDURES

32. Disconnect all power and video cables from the rear of the projector and remove from frame.
33. Holding the projector in place, loosen projector mounting clamp and lower projector. Install lens cap and place projector into transport case.
34. Using clean hands or gloves, remove the projection screen from the screen frame by unsnapping at each snap. Do not grab the projection screen by the corners and pull off of the screen frame. This will cause snap or projection screen damage. Follow the Projection Screen Folding Instructions on the next page.
35. Ensure personnel are clear from area below projector support arm. Disconnect the adjustable steel cables (12) at the projector support arm (11) (see Figure 7) and slowly lower the projection support arm. Remove projector support arm and adjustable steel cables and place in transport case.
36. Remove both upper (5) and lower (6) support crossbar (see Figure 3) from frame (1) and place in transport case
37. Unlock all support braces (3), retract four folding legs (2) and collapse the screen frame (1) as shown in Figure 13. Place folded screen frame into the transport case.

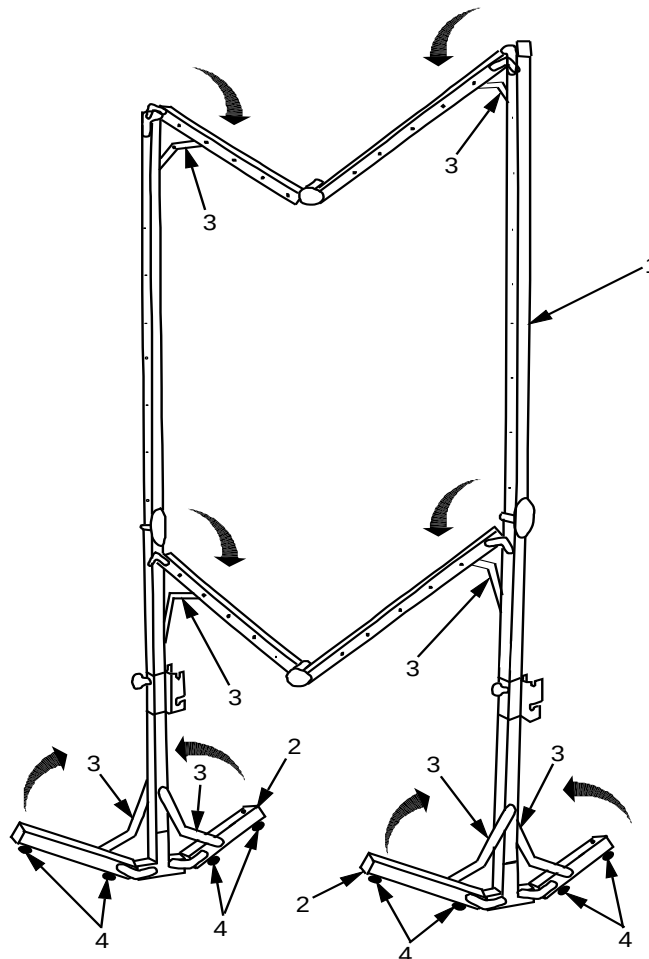


Figure 13. Collapse Screen Frame.

PROJECTION SCREEN FOLDING INSTRUCTIONS

Please follow the following steps outlined below when folding the screen material for packing.

NOTE

Make sure the surface does not come in contact with a painted, varnished, plastic, or dyed surface or object. Prolonged contact with any one of these material could cause a chemical reaction and compromise the screen's physical or optical quality. This can be accomplished by laying a white clean cotton fabric or paper (slightly larger than the screen size) on a flat surface prior to folding the screen.

38. With the white surface facing up, fold the screen in half from top to bottom as shown in Figure 14. Make sure the screen never comes in contact with the black binding, grommets or snap buttons. Please note that for this to happen, one must make sure all folds subsequent to the first fold stop short of black binding material as illustrated below.
39. Place clean tissue paper or white 100% cotton material between the folds.

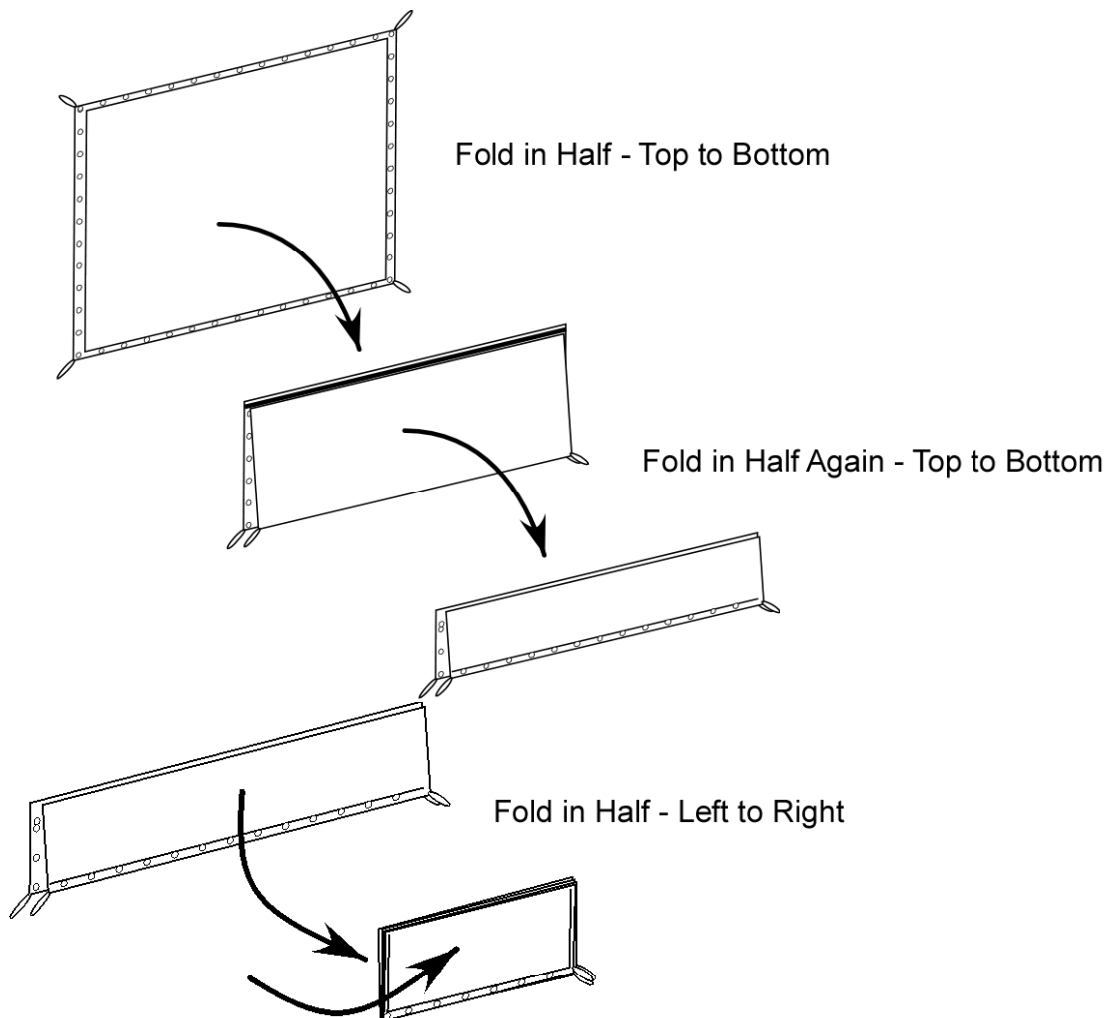


Figure 14. Folding Screen.

40. Once the top to bottom folding is complete, fold from left to right and continue folding until the folded area is small enough to fit into the vinyl pouch. Please note that the final fold must stop short of the black binding material to keep the viewing area away from it and snap buttons as illustrated.

WARNING

The screen surface must be stored in its pouch when not in use to prevent damage and discoloration. While in storage, avoid extreme temperature conditions. If surface becomes sticky, see cleaning instruction in WP 0016.

END OF TASK

END OF WORK PACKAGE

**OPERATOR INSTRUCTIONS
MEDIUM XGA PROJECTION SYSTEM
JOINING MULTIPLE SCREENS PROCEDURES**

GENERAL

This Work Package details setup, disassembly, and storing of joining multiple screens of the Medium XGA Projection System.

SITE REQUIREMENTS

To ensure minimal problems and good operation of multiple screens for the Medium XGA Projection System, ensure area is:

- Dry
- Level and ensure you have enough space to assemble multiple screens (refer to WP 0005 for site requirements assembled frame).
- Free of any obstructions that would interfere with joining multiple screens and projector viewing area.

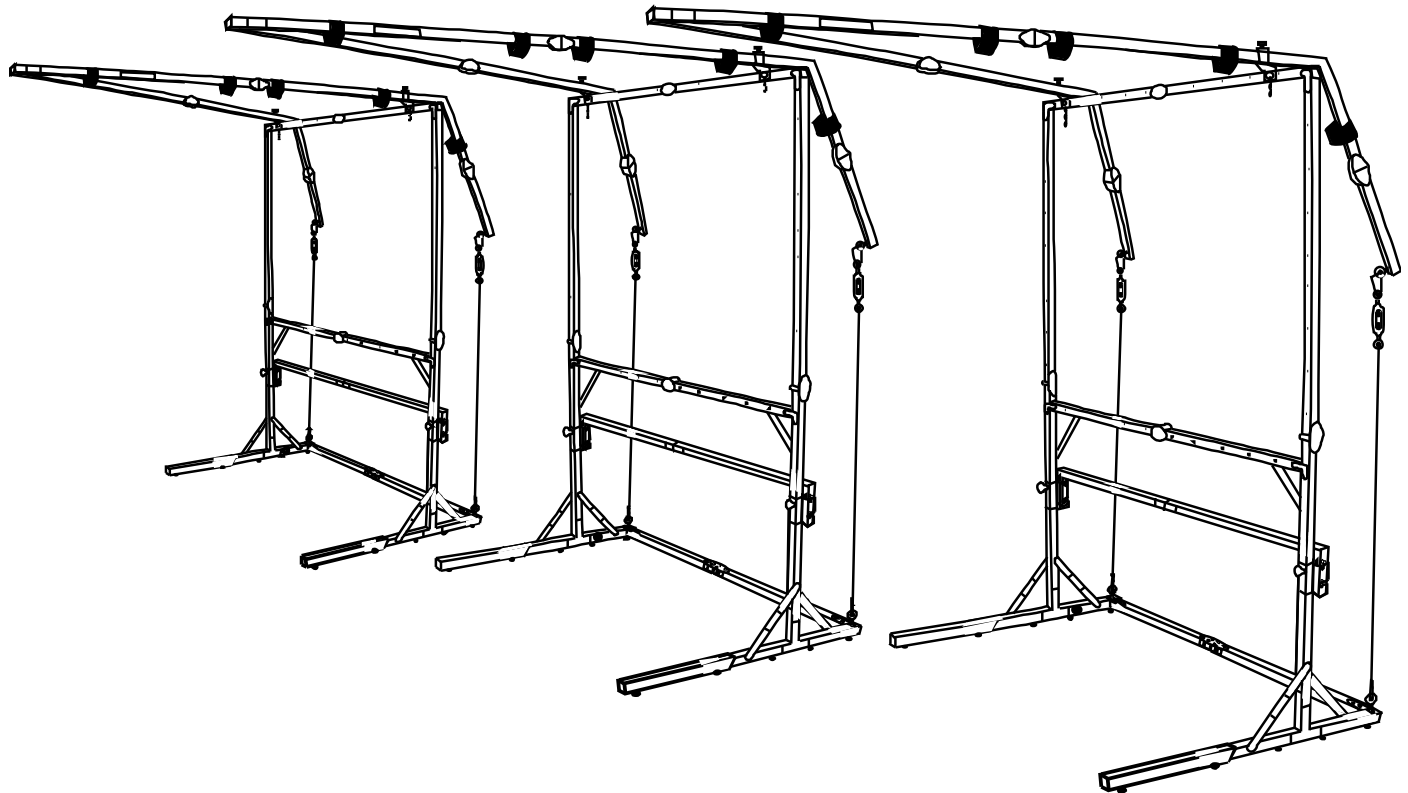


Figure 1. Joining Multiple Screens.

JOINING MULTIPLE SCREENS PROCEDURES**WARNING**

Each screen surface must be stored in its pouch when not in use to prevent damages. If stored at temperatures far below room temperatures, allow the each screen to warm up to room temperature before unfolding. This will ensure the film is being handled in its most flexible state and will prevent surface cracks.

WARNING

There are seventeen pivot (pinch) points located around each frame assembly.

ASSEMBLE FRAME

Assemble each frame that will be joined together for a multiple screen display in accordance with Assembly Procedures in WP 0005. Once the required number of screen frames has been assembled, follow the steps below for joining the multiple screens together.

1. Using the Straight Joining Deluxe Clamp (16) supplied with each system, join screen frames (1) together side by side as shown in Figure 2.
2. Position the Straight Joining Deluxe Clamp (16) on the back side of the screen frame (1) near the upper and lower corners of the screen (see Figure 2).
3. Attach Projector to the Projector Support Arm in accordance with WP 0005.
4. Attach Screen to Frame Assembly in accordance with WP 0005.

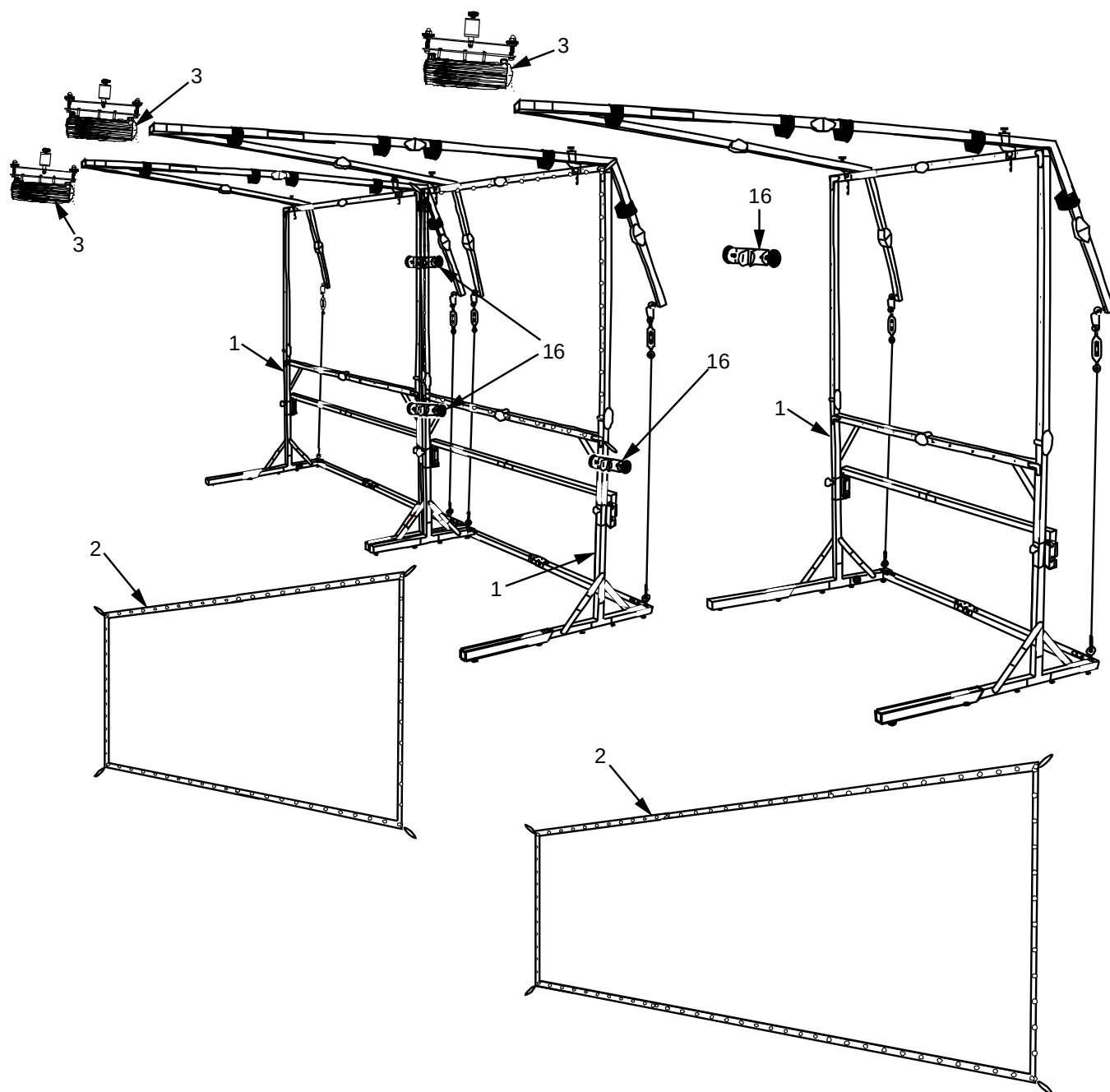
ASSEMBLE FRAME (Cont)

Figure 2. Joining Multiple Screen Frames

END OF TASK**END OF WORK PACKAGE**

**OPERATOR INSTRUCTIONS
MEDIUM XGA PROJECTION SYSTEM
OPERATIONS UNDER USUAL CONDITIONS**

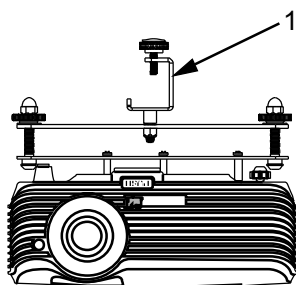
GENERAL

The following WP details projector adjustment and manual adjustments to the projective image procedures of the DC2E Medium XGA Projection System.

PROJECTOR ORIENTATION

The Medium XGA Projections System features a DLP projector that accepts and displays images with a resolution of 1024 x 768 (XGA) and the Lens F number range is 2.56 to 2.8. Multiple screens can connect together to form a single large screen. If the Projector is not properly configured for its intended operating mode, the image from the projector will not display properly on the screen and there will be little or no adjustment possible.

The projector that is used in the Medium XGA Projections System (see Figure 1) hangs from the projector mount (Figure 1, Item 1) which is secured by a clamp underneath the projector support arm.



Front View

Top View

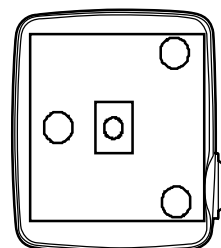


Figure 1. Projector and Mount Configuration.

ADJUSTMENT OF THE PROJECTOR

Three adjusting knurled knobs are provided on the projector mount (1) to align the projected image to the projection surface. The following diagrams indicate how to use the adjusting knurled knobs to correct the projected image.

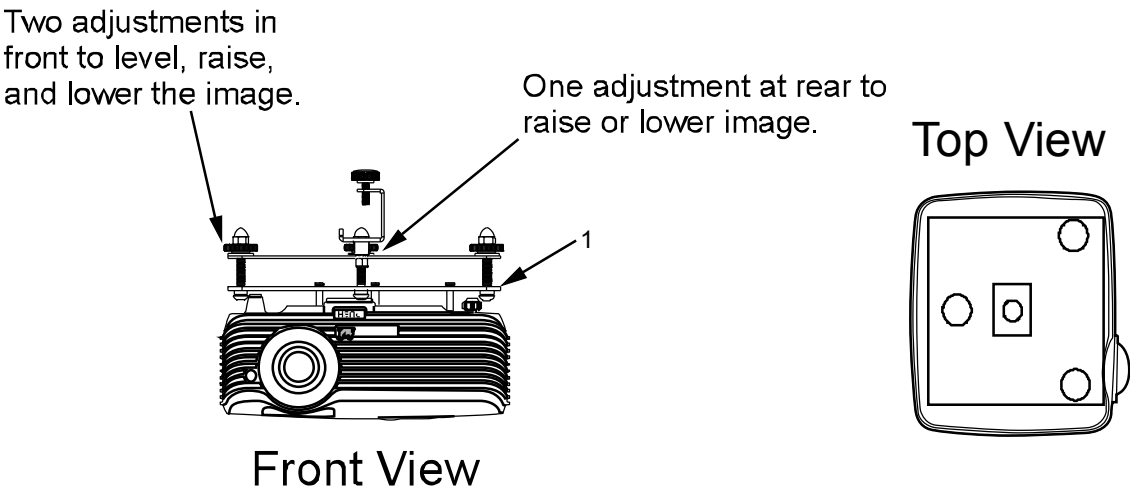


Figure 2. Adjusting the Projector

ADJUSTING THE MOUNT ASSEMBLY

Should the mount come apart, it goes back together in this order.

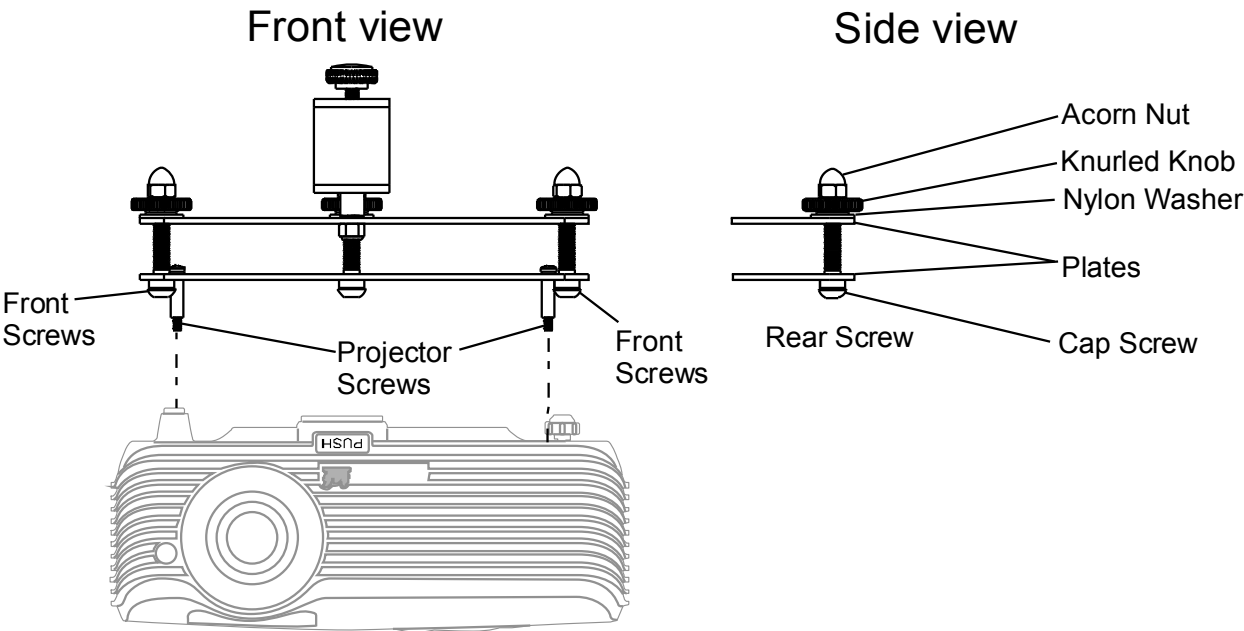


Figure 3. Adjusting Mount Assembly

END OF TASK

PROJECTOR CONNECTIONS

When connecting a signal source to the projector, be sure to the following:

- Turn off all equipment before making any connections.
- Use the correct signal cables for each source.
- Ensure the cables are firmly inserted.

CONNECTING A COMPUTER

The projector provides two VGA input sockets that allow you to connect them to both IBM® compatibles and Macintosh® computers. A Mac adapter is needed if you are connecting legacy version Macintosh computers.

TO CONNECT THE PROJECTOR TO A NOTEBOOK OR DESKTOP COMPUTER:

1. Take the supplied VGA cable and connect one end to the D-Sub output socket of the computer.
2. Connect the other end of the VGA cable to the **COMPUTER IN 1** or **COMPUTER IN 2** signal input socket on the projector.
3. If you wish to make use of the projector (mixed mono) speaker in your presentations, take a suitable audio cable and connect one end of the cable to the audio output socket of the device, and the other end to the **AUDIO IN** socket of the projector.
4. If you wish, you can use another suitable audio cable and connect one end of the cable to the **AUDIO OUT** socket of the projector, and the other end to your external speakers (not supplied).

Once connected, the audio can be controlled by the projector On-Screen Display (OSD) menus. See "Adjusting the sound" in this WP, on page 38 for details.

The final connection path should be as shown in Figure 4:

NOTE

Many notebooks do not turn on their external video ports when connected to a projector. Usually a key combo like FN + F3 or CRT/LCD key turns the external display on/off. Locate a function key labeled CRT/LCD or a function key with a monitor symbol on the notebook. Press FN and the labeled function key simultaneously. Refer to your notebook's documentation to find your notebook's key combination.

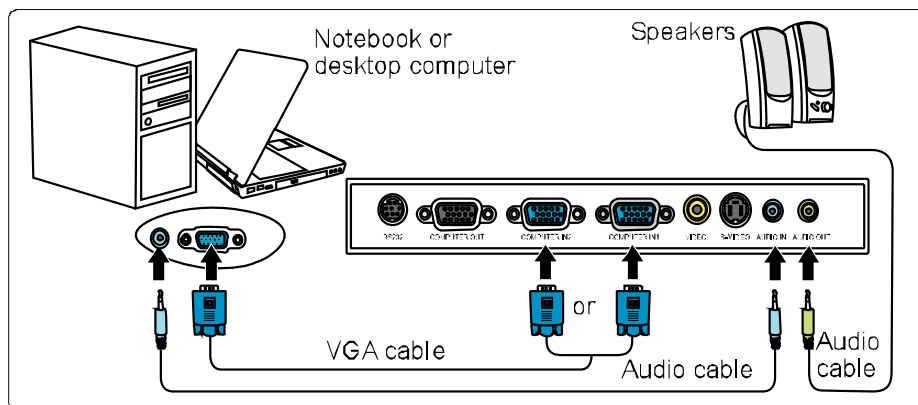


Figure 4. Connecting a Computer.

CONNECTING A MONITOR

If you want to view your presentation close-up on a monitor as well as on the screen, you can connect the **COMPUTER OUT** signal output socket on the projector to an external monitor with a VGA cable following the instructions below:

TO CONNECT THE PROJECTOR TO A MONITOR:

1. Connect the projector to a computer as described in "Connecting a computer".
2. Take a suitable VGA cable (only one supplied) and connect one end of the cable to the D-Sub input socket of the video monitor.

Or if your monitor is equipped with a DVI input socket, take a VGA to DVI-A cable and connect the DVI end of the cable to the DVI input socket of the video monitor.

3. Connect the other end of the cable to the **COMPUTER OUT** socket on the projector.

The final connection path should be as shown in Figure 5:

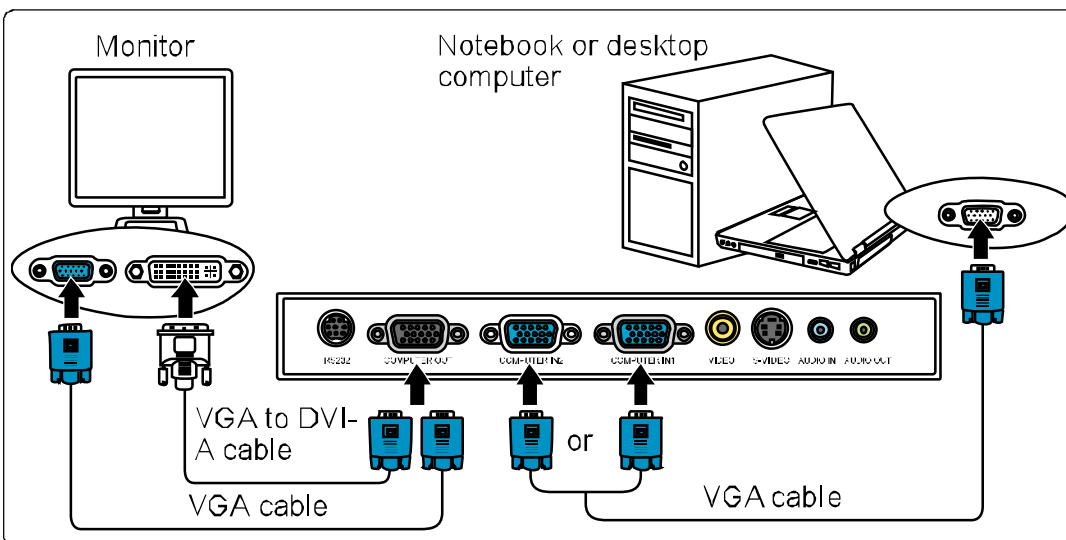


Figure 5. Connecting a Monitor.

CONNECTING VIDEO SOURCE DEVICES

You can connect your projector to various Video source devices that provide any one of the following output sockets:

- Component Video
- S-Video
- Video (composite)

You need only connect the projector to a Video source device using just one of the above connecting methods, however each provides a different level of video quality. The method you choose will most likely depend upon the availability of matching terminals on both the projector and the Video source device as described below:

Best Video Quality

The best available video connection method is Component Video (not to be confused with composite Video). Digital TV tuner and DVD players output Component Video natively, so if available on your devices, this should be your connection method of choice in preference to (composite) Video.

See "Connecting a Component Video source device" on page 6 for how to connect the projector to a component video device.

Better Video Quality

The S-Video method provides a better quality analog video than standard composite Video. If you have both composite Video and S-Video output terminals on your Video source device, you should elect to use the S-Video option.

See "Connecting an S-Video source device" on page 7 for how to connect the projector to an S-Video device.

Least Video Quality

Composite Video is an analog video and will result in a perfectly acceptable, but less than optimal result from your projector, being the least video quality of the available methods described here.

See "Connecting a composite Video source device" on page 8 for how to connect the projector to a composite Video device.

Connecting Audio

The projector has one built-in mono speaker which is designed to provide basic audio functionality accompanying data presentations for business purposes only. They are not designed for, nor intended for stereo audio reproduction use as might be expected in home theater or home cinema applications. Any stereo audio input (if provided), is mixed into a common mono audio output through the projector speaker.

If you wish, you can make use of the projector (mixed mono) speaker in your presentations, and also connect separate amplified speakers to the Audio Out socket of the projector. The audio output is a mixed mono signal and controlled by the projector Volume and Mute settings.

If you have a separate sound system, you will most likely want to connect the audio output of your Video source device to that sound system, instead of to the mono audio projector.

CONNECTING A COMPONENT VIDEO SOURCE DEVICE

Examine your Video source device to determine if it has a set of unused Component Video output sockets available:

- If so, you can continue with this procedure.
- If not, you will need to reassess which method you can use to connect to the device.

TO CONNECT THE PROJECTOR TO A COMPONENT VIDEO SOURCE DEVICE:

1. Take a Component Video to VGA (D-Sub) adaptor cable and connect the end with 3 RCA type connectors to the Component Video output sockets of the Video source device. Match the color of the plugs to the color of the sockets; green to green, blue to blue, and red to red.
2. Connect the other end of the Component Video to VGA (D-Sub) adaptor cable (with a D-Sub type connector) to the **COMPUTER IN 1** or **COMPUTER IN 2** socket on the projector.
3. If you wish to make use of the projector (mixed mono) speaker in your presentations, take a suitable audio cable and connect one end of the cable to the audio output socket of the device, and the other end to the **AUDIO IN** socket of the projector.
4. If you wish, you can use another suitable audio cable and connect one end of the cable to the **AUDIO OUT** socket of the projector, and the other end to your external speakers.

Once connected, the audio can be controlled by the projector On-Screen Display (OSD) menus. See "Adjusting the sound" on page 38 for details.

The final connection path should be as shown in Figure 6:

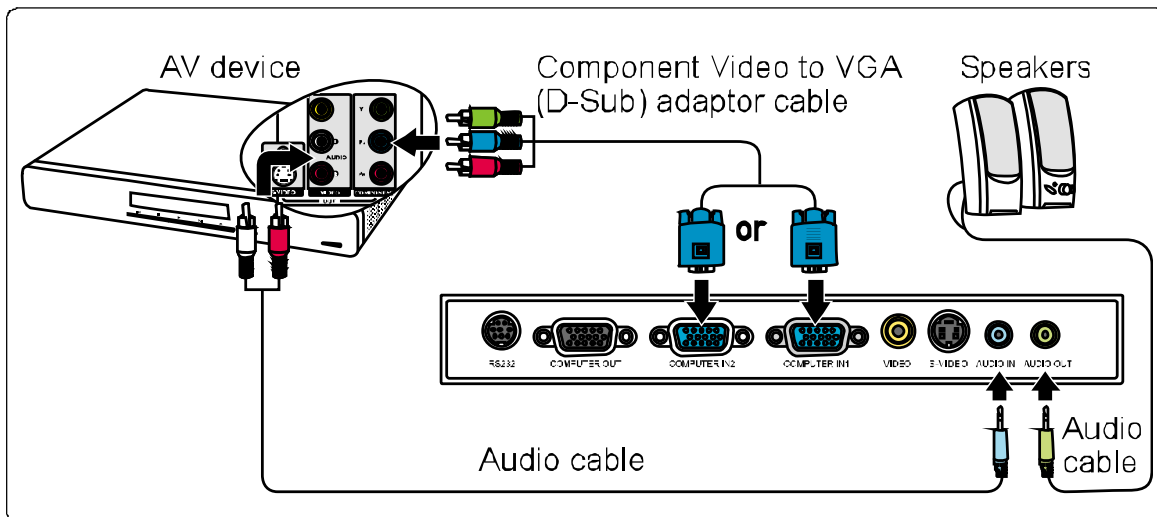


Figure 6. Connecting a Component Video Source Device.

CONNECTING AN S-VIDEO SOURCE DEVICE

Examine your Video source device to determine if it has an unused S-Video output socket available:

- If so, you can continue with this procedure.
- If not, you will need to reassess which method you can use to connect to the device.

TO CONNECT THE PROJECTOR TO AN S-VIDEO SOURCE DEVICE:

1. Take an S-Video cable and connect one end to the S-Video output socket of the Video source device.
2. Connect the other end of the S-Video cable to the **S-VIDEO** socket on the projector.
3. If you wish to make use of the projector (mixed mono) speaker in your presentations, take a suitable audio cable and connect one end of the cable to the audio output socket of the device, and the other end to the **AUDIO IN** socket of the projector.
4. If you wish, you can use another suitable audio cable and connect one end of the cable to the **AUDIO OUT** socket of the projector, and the other end to your external speakers

Once connected, the audio can be controlled by the projector On-Screen Display (OSD) menus. See "Adjusting the sound" on page 38 for details.

The final connection path should be as shown in Figure 7:

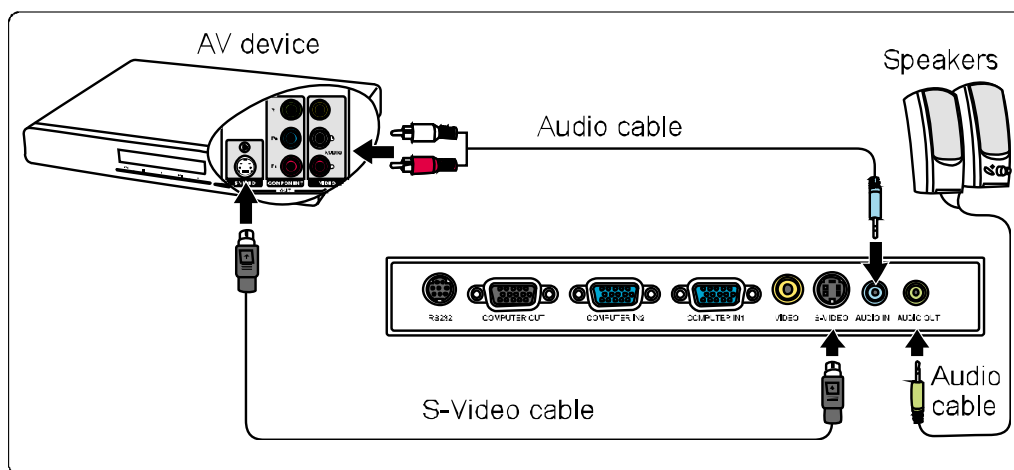


Figure 7. Connecting S-Video Source Device.

NOTE

The projector is only capable of playing mixed mono audio, even if a stereo audio input is connected. See "Connecting audio" in this WP on page 5 for details.

- If the selected video image is not displayed after the projector is turned on and the correct video source has been selected, check that the Video source device is turned on and operating correctly. Also check that the signal cables have been connected correctly.
- If you have already made a Component Video connection between the projector and this S-Video source device using Component Video connections, you need not connect to this device using an S-Video connection as this makes an unnecessary second connection of poorer picture quality. See "Connecting Video source devices" in this WP on page 5 for details.

CONNECTING A COMPOSITE VIDEO SOURCE DEVICE

Examine your Video source device to determine if it has a set of unused composite Video output sockets available:

- If so, you can continue with this procedure.
- If not, you will need to reassess which method you can use to connect to the device.

TO CONNECT THE PROJECTOR TO A COMPOSITE VIDEO SOURCE DEVICE:

1. Take a Video cable and connect one end to the composite Video output socket of the Video source device.
2. Connect the other end of the Video cable to the **VIDEO** socket on the projector.
3. If you wish to make use of the projector (mixed mono) speaker in your presentations, take a suitable audio cable and connect one end of the cable to the audio output socket of the device, and the other end to the **AUDIO IN** socket of the projector.
4. If you wish, you can use another suitable audio cable and connect one end of the cable to the **AUDIO OUT** socket of the projector, and the other end to your external speakers

Once connected, the audio can be controlled by the projector On-Screen Display (OSD) menus. See "Adjusting the sound" on page 38 for details.

The final connection path should be as shown in Figure 8:

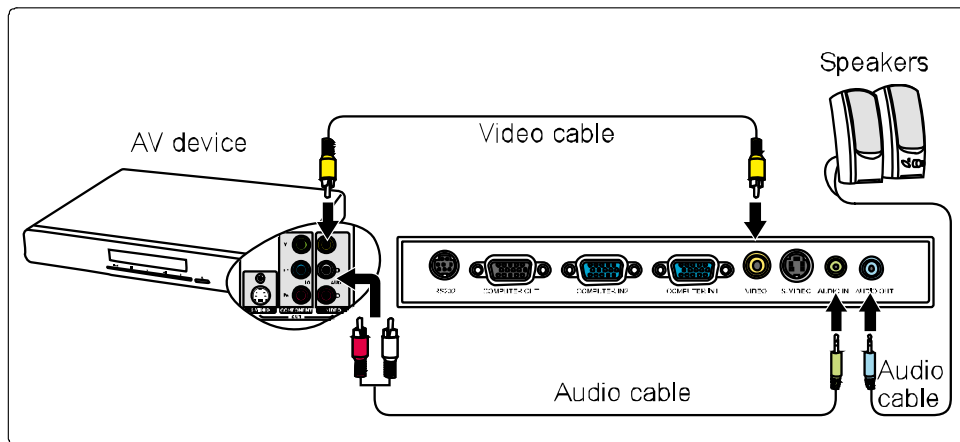


Figure 8. Connecting Composite Video Source Device.

NOTE

The projector is only capable of playing mixed mono audio, even if a stereo audio input is connected. See "Connecting audio", in this WP on page 5 for details.

- If the selected video image is not displayed after the projector is turned on and the correct video source has been selected, check that the Video source device is turned on and operating correctly. Also check that the signal cables have been connected correctly.
- You need only connect to this device using a composite Video connection if Component Video and S-Video inputs are unavailable for use. See "Connecting Video source devices", in this WP on page 5 for details.

END OF TASK

OPERATION

PROJECTOR POWER UP PROCEDURES

1. Plug the power cord into the projector and into a wall socket as shown in Figure 9. Check that the **POWER indicator light** on the projector flashes blue after power has been applied.
2. Remove the lens cap. If the lens is covered, the lens cap could become deformed due to the heat produced by the projection lamp (see Figure 9).
3. Press  **POWER** on the projector or remote control to start the projector. The **POWER indicator light** stays blue when the projector is on (see Figure 9).

The start up procedure takes about 30 seconds. In the later stage of start up, a startup logo is projected.

NOTE

If the projector is still hot from previous activity, it will run the cooling fan for approximately 90 seconds before energizing the lamp.

To maintain the lamp life, once the projector is turned on, wait at least 5 minutes before turning it off.

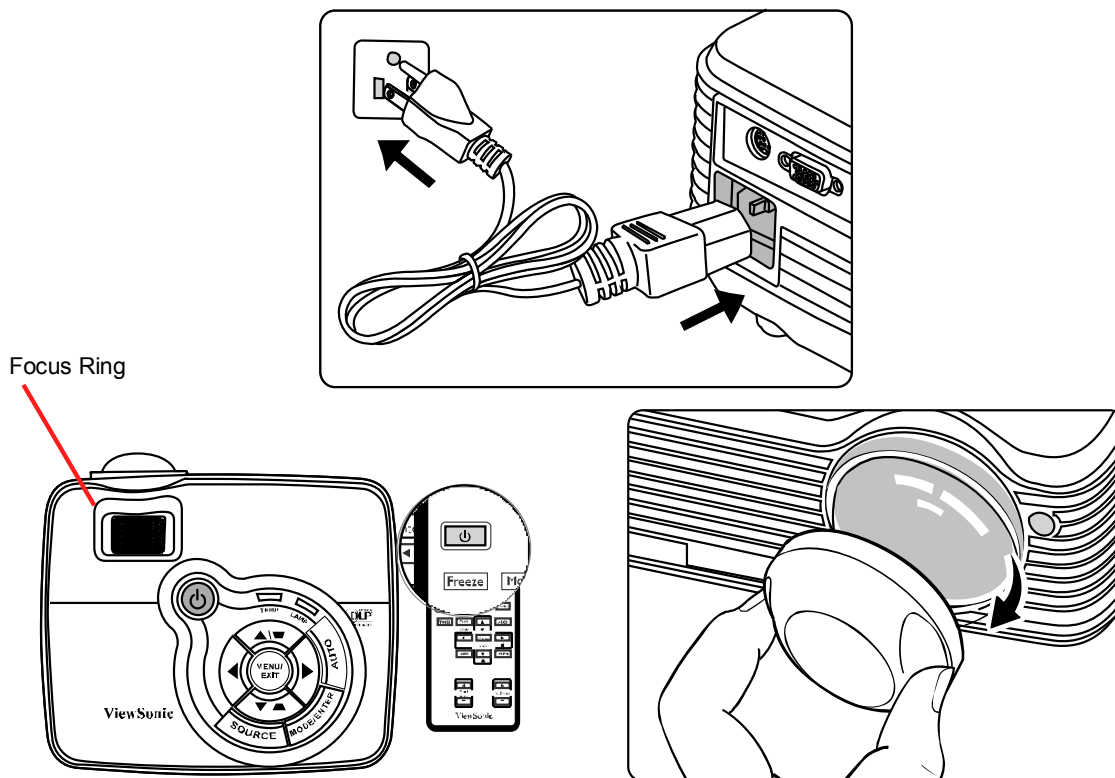


Figure 9. Projector Power Up.

PROJECTOR POWER UP PROCEDURES (Cont)

(If necessary) Rotate the focus ring to adjust the image clarity.

4. Switch on all of the connected equipment.
5. The projector will start to search for input signals. The current input signal being scanned displays in the upper left corner of the screen. If the projector doesn't detect a valid signal, the message **'No Signal'** will continue displaying until an input signal is found.

You can also press **SOURCE** on the projector or remote control to select your desired input signal. See "Switching Input Signal" on page 24 for details

NOTE

If the frequency/resolution of the input signal exceeds the projector's operating range, you will see the message 'Out of Range' displayed on a blank screen. Please change to an input signal which is compatible with the projector's resolution or set the input signal to a lower setting.

REMOTE CONTROL**REMOTE CONTROL RANGE**

Infra-Red (IR) remote control sensor is located on the front of the projector. The remote control must be held at an angle within 30 degrees perpendicular to the projector's IR remote control sensor to function correctly. The distance between the remote control and the sensor should not exceed 26 feet (8 meters).

Make sure that there are no obstacles between the remote control and the IR sensor on the projector that might obstruct the infra-red beam.

REPLACING THE REMOTE CONTROL BATTERY

1. Push and hold the locking slide while pulling out the battery holder as shown in Figure 10.
2. Pull out battery holder.
3. Remove and replace battery. Note the positive polarity should face outward.
4. Push battery holder into remote control as shown in Figure 10. Ensure locking slide locks in place.

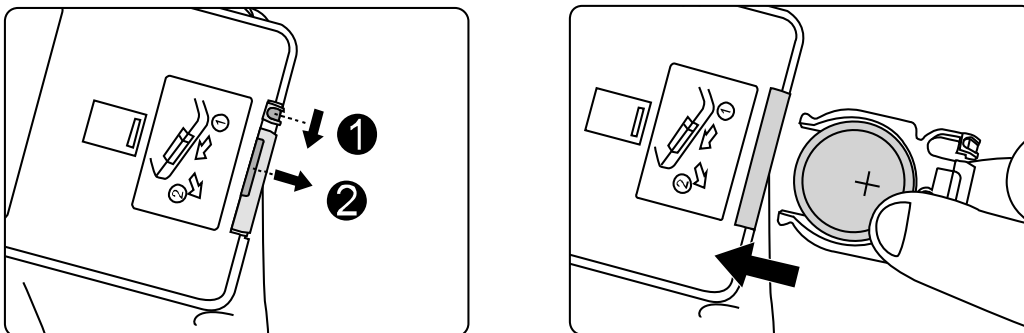


Figure 10. Remote Control Battery Compartment.

END OF TASK

MANUAL ADJUSTMENTS TO THE PROJECTED IMAGE

The projection system frame was aligned at the factory and marked with reference marks for locating the hinges, projection support arm and projector mounting location on the projector support arm. Using these marks as guides during assembly should result in the system being very close to correct alignment. The adjustment knobs located on the projector mount may be all that requires adjustment to obtain proper image alignment to the screen. Another thing that can affect the image alignment is the projector lens not aimed directly at 90 degrees horizontally to the screen surface. This will cause the image to appear too large on the left or right side depending on the angle of the projector right or left.

Remember when making adjustments, one adjustment may affect another. Small incremental adjustments are recommended. Adjustments are best performed with two people, one to monitor the image and one to perform the adjustment.

PROJECTED IMAGE TOO SMALL

Both hinged clamps on the projector support arm must be loosened. The projector support arm will be easier to adjust if someone supports the weight of the projector. Adjust both projector support arms in towards the projection screen in equal distances. Ensure to retighten the hinged clamps on the projector support arm.

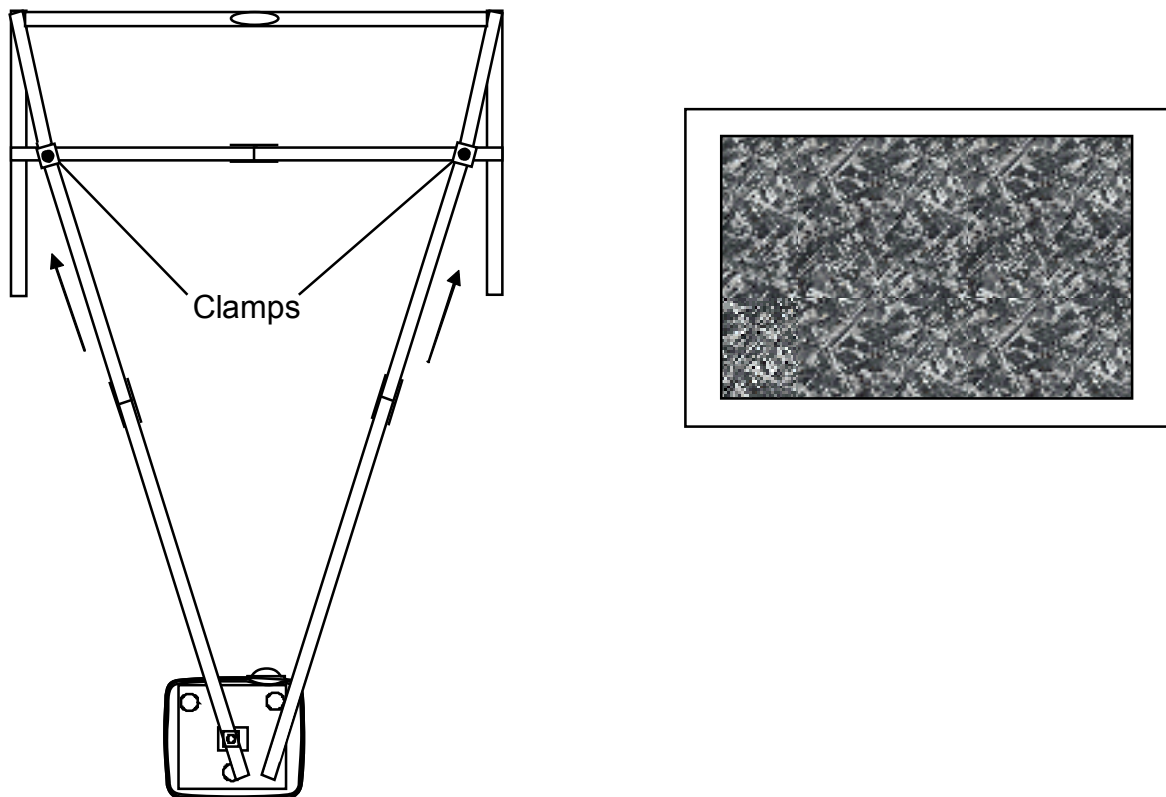


Figure 11. Projected Image too Small.

PROJECTED IMAGE TOO LARGE

Both hinged clamps on the projector support arm must be loosened. The projector support arm will be easier to adjust if someone supports the weight of the projector. Adjust both projector support arms out away from the projection screen in equal distances. Ensure to retighten the hinged clamps on the projector support arm.

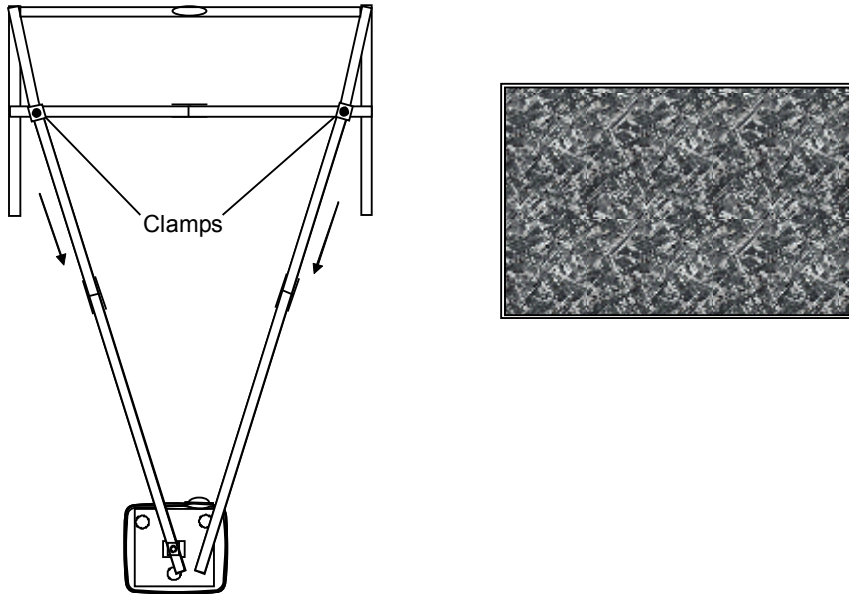


Figure 12. Projected Image too Large.

PROJECTED IMAGE TOO LARGE ON RIGHT

One hinged clamp on the projector support arm must be loosened at a time. The projector support arm will be easier to adjust if someone supports the weight of the projector. Adjust the projector support arm, left side away from the projection screen or right side in towards the projection screen, incrementally until proper image is obtained. Ensure to retighten the hinged clamps on the projector support arms.

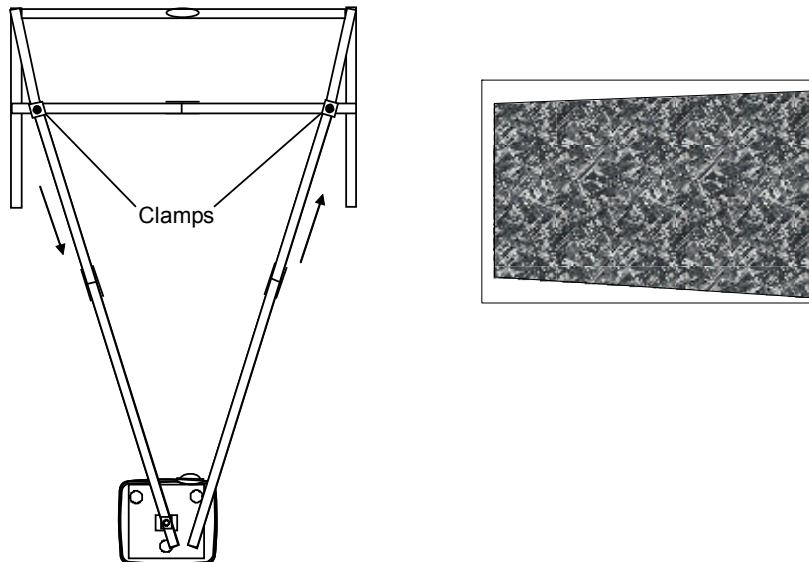


Figure 13. Image too Large on Right.

PROJECTED IMAGE TOO LARGE ON LEFT

One hinged clamp on the projector support arm must be loosened at a time. The projector support arm will be easier to adjust if someone supports the weight of the projector. Adjust the projector support arm, left side in toward the projection screen or right side away from the projector screen, incrementally until proper image is obtained. Ensure to retighten the hinged clamps on the projector support arms.

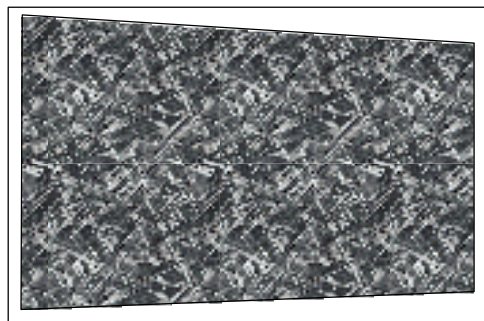
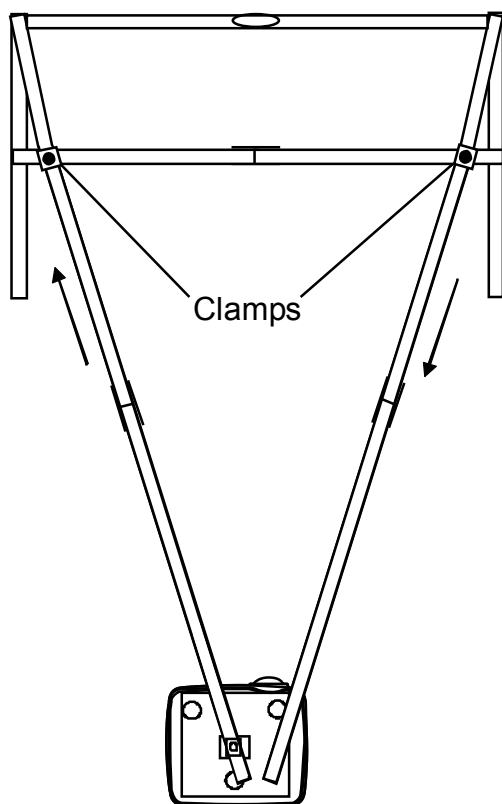


Figure 14. Image too Large on Left.

PROJECTED IMAGE TOO SMALL AT TOP

Ensure that the projector is level and not tilted down. If the projector is level, use the turnbuckles to lengthen the adjustable steel cables until proper alignment is obtained. Check eye-bolts on the rear legs and the projector support arm to ensure that they are securely tightened before and after adjustments.

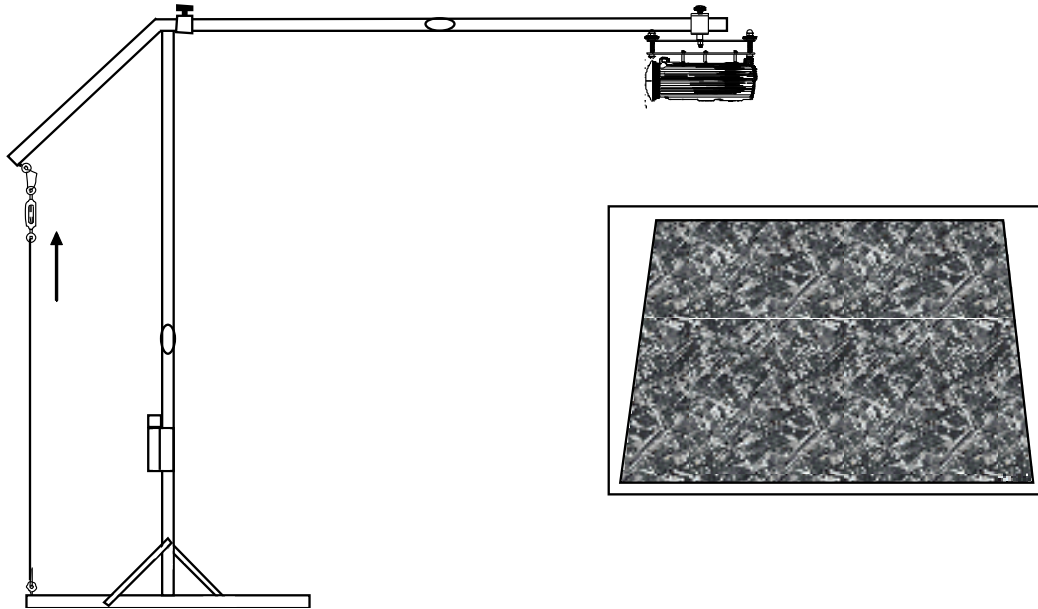


Figure 15. Image too Small at Top.

PROJECTED IMAGE TOO LARGE AT TOP

Ensure that the projector is level and not tilted up. If the projector is level, use the turnbuckles to shorten the adjustable steel cables until proper alignment is obtained. Check eye-bolts on the rear legs and the projector support arm to ensure that they are securely tightened before and after adjustments.

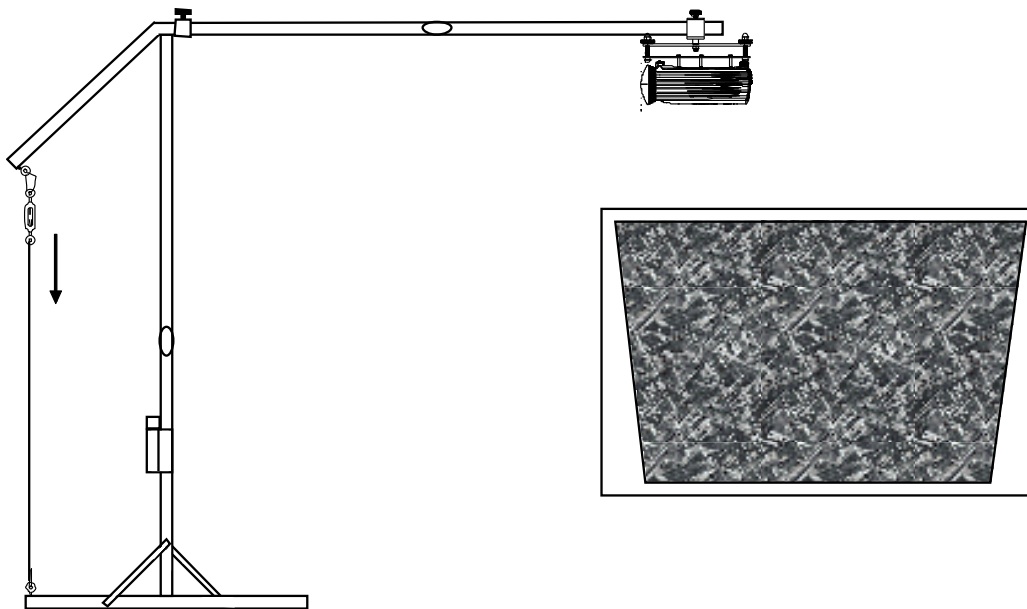


Figure 16. Image too Large at Top.

PROJECTED IMAGE NOT LEVEL

Use the front two adjusting knurled knobs on the projector mount to level the image horizontally.

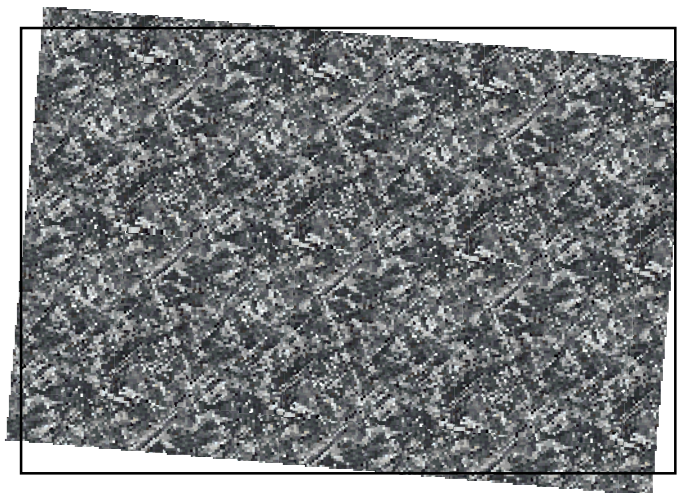
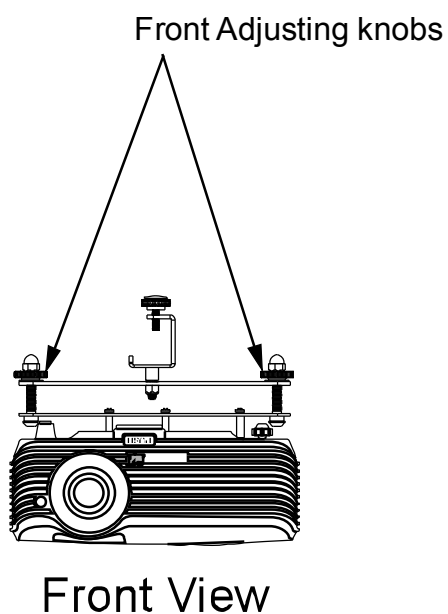


Figure 17. Image not Level.

PROJECTED IMAGE TOO LOW

Use the front two adjusting knurled knobs on the projector mount to level the image horizontally.

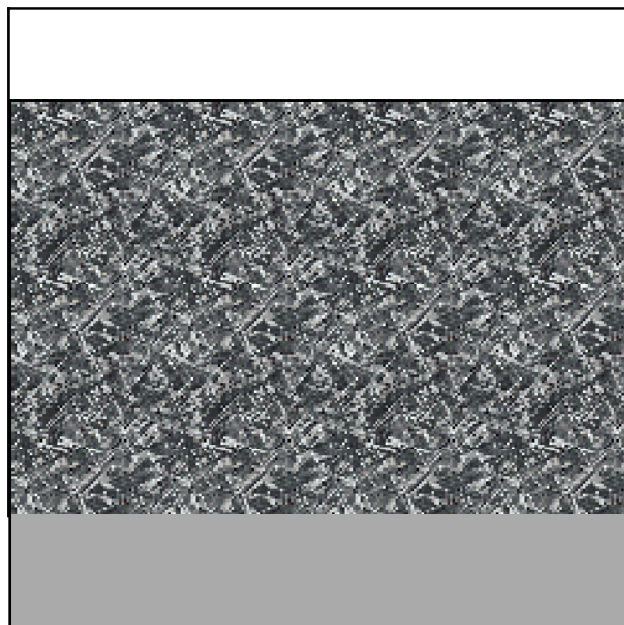
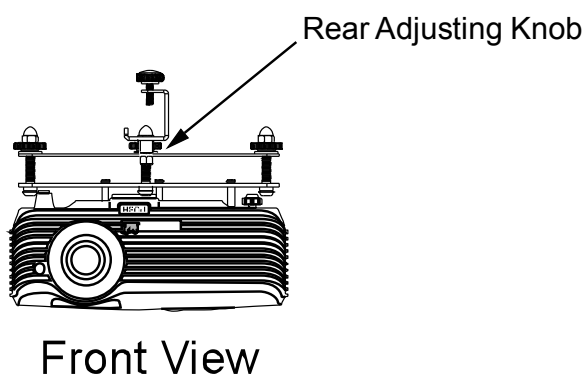


Figure 18. Image too Low.

PROJECTED IMAGE TOO HIGH

Use the rear adjusting knurled knob on the projector mount to lower the projected image as required. The front two adjusting knurled knobs can also be used to lower the projected image.

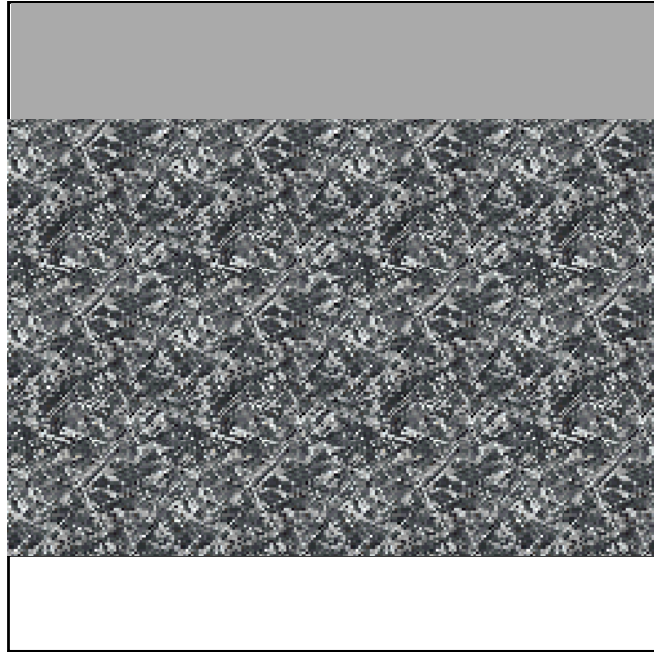
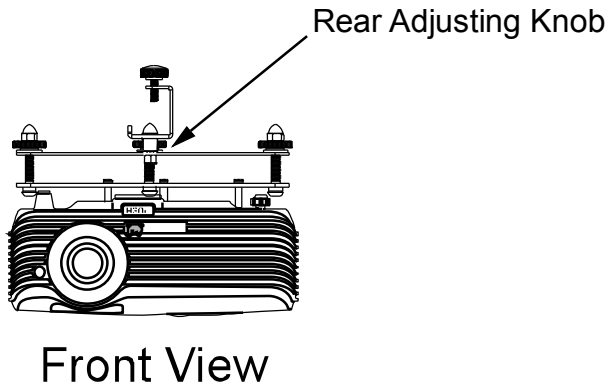


Figure 19. Image too High.

END OF TASK

ON-SCREEN DISPLAY (OSD) MENU

USING THE ON-SCREEN DISPLAY (OSD)

The projector is equipped with On-Screen Display (OSD) menus for making various adjustments and settings. The menu system gives access to a multitude of image and system controls. The menu system is structured through a top menu and several sub menus.

Press the MENU/EXIT key on the projector or remote control to turn the OSD menu on and navigate using the arrow keys on the keypad or the arrow keys on the remote control.

Below is the overview of the OSD menu.

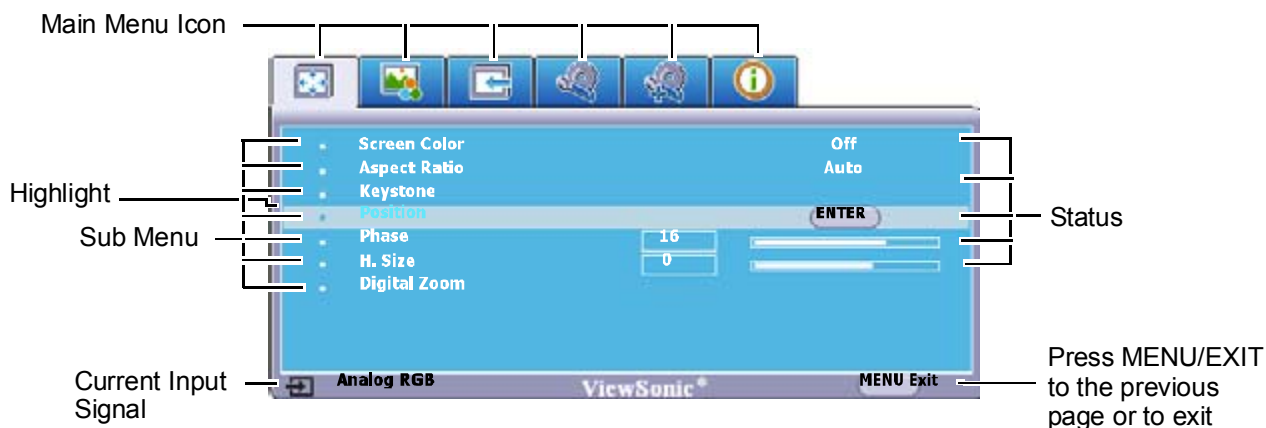
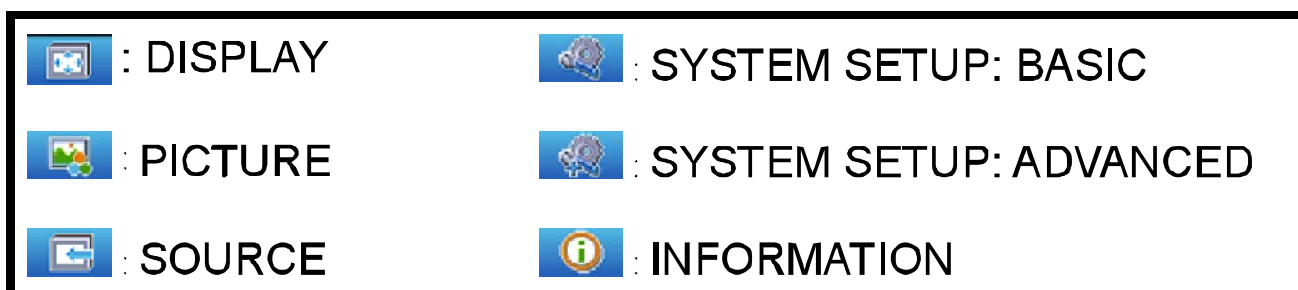


Figure 20. On-Screen Display (OSD) Menu.

Table 20. On-Screen Display Menu.

FUNCTION	DESCRIPTION
DISPLAY	Main menu and sub menu controls.
PICTURE	Basic and advance picture controls.
SOURCE	Settings that affect how the projector behaves or interacts with third party devices, such as networks and control systems.
SYSTEM SETUP - BASIC	User defines settings (i.e. Language) and ore-stored settings.
SYSTEM SETUP - ADVANCED	Security settings.
INFORMATION	System information.

USING THE ON-SCREEN DISPLAY (OSD) (Cont)

To use the OSD menus, please set them to your familiar language first.

- 1. Press **MENU/EXIT** on the projector or remote control to turn the OSD menu on.

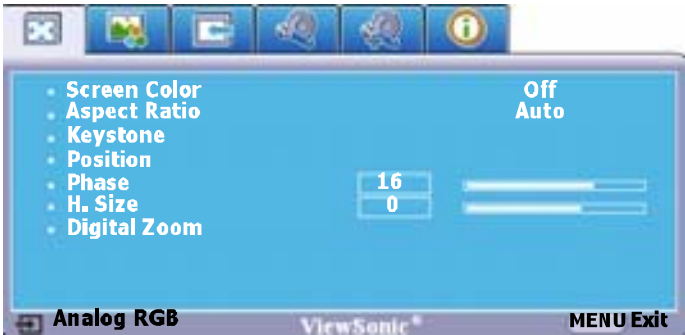


Figure 21. Setting Up Familiar Language.

- 2. Use ◀/▶ to highlight the **SYSTEM SETUP: Basic** menu.

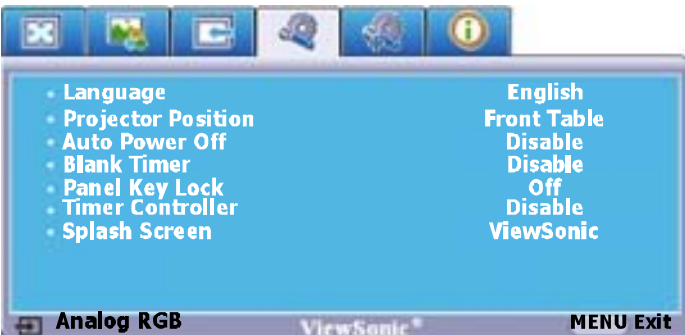


Figure 22. System Setup Basic Menu for Language.

- 3. Press ▼ to highlight **Language** and press ◀/▶ to select a preferred language.



Figure 23. Selecting Language.

USING THE ON-SCREEN DISPLAY (OSD) (Cont)

4. Press **MENU/EXIT** twice* on the projector or remote control to leave and save the settings.

NOTE

*The first press leads you back to the main menu and the second press closes the OSD menu

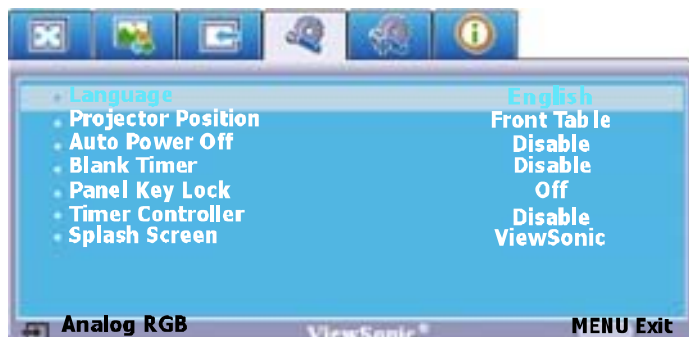


Figure 24. Exit Language Setup

UTILIZING THE PASSWORD FUNCTION

For security purposes and to help prevent unauthorized use, the projector includes an option for setting up password security. The password can be set through the On-Screen Display (OSD) menu. For details of the OSD menu operation, please refer to "Using the Menus" on page 17.

NOTE

You will be inconvenienced if you activate the password functionality and subsequently forget the password. Print this user manual (if necessary) and write the password in the space provided below and keep it in a safe place for later use.

SETTING A PASSWORD**NOTE**

Once a password has been set, the projector cannot be used unless the correct password is entered every time the projector is started.

1. Open the OSD menu and go to the **SYSTEM SETUP: Advanced > Security Settings** menu. Press **MODE/ENTER**. The **Security Settings** page displays.
2. Highlight **Power On Lock** and select **On** by pressing **◀/▶**.

SETTING A PASSWORD (Cont)

3. As pictured in Figure 25, the four arrow keys (▲, ►, ▼, ◀) respectively represent 4 digits (1, 2, 3, 4). According to the password you desire to set, press the arrow keys to enter six digits for the password.

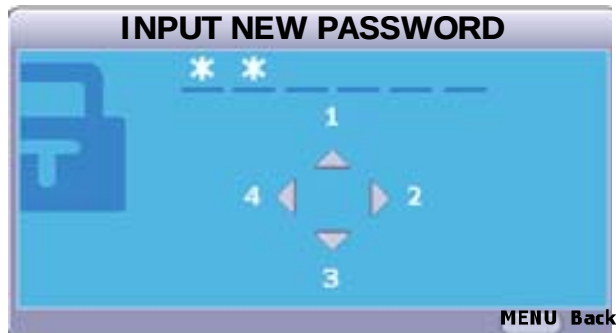


Figure 25. Setting a Password.

4. Confirm the new password by re-entering the new password.

Once the password has been set, the OSD menu will return to the **Security Settings** page.

NOTE

The digits being input will display as asterisks on-screen. Write your selected password down here in this user manual in advance or right after the password is entered so that it is available to you should you ever forget it.

Password: _____

Keep this user manual in a safe place.

5. To leave the OSD menu, press **MENU/EXIT**.

FORGETTING THE PASSWORD

If the password function is activated, you will be asked to enter the six-digit password every time you turn on the projector. If you enter the wrong password, the password error message as pictured to the right displays lasting for three seconds, and the message '**INPUT PASSWORD**' follows. You can retry by entering another six-digit password, or if you did not record the password in this user manual, and you absolutely do not remember it, you can use the password recall procedure. See "Entering the password recall procedure" on page 21 for details.

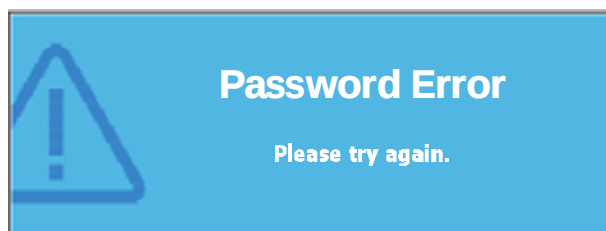


Figure 26. Password Error.

If you enter an incorrect password 5 times in succession, the projector will automatically shut down in a short time.

PASSWORD RECALL PROCEDURES

1. Press and hold **AUTO** on the projector or remote control for 3 seconds. The projector will display a coded number on the screen.
2. Write down the number and turn off your projector.

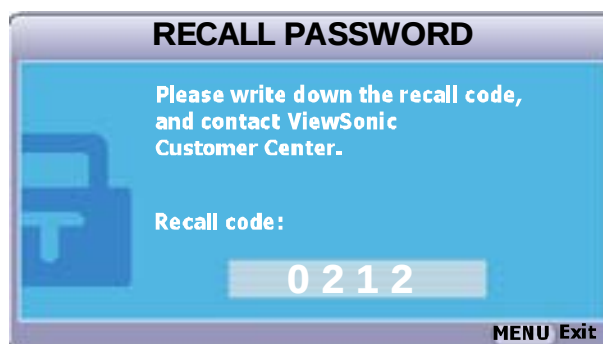


Figure 27. Password Recall.

3. Seek help from the local service center to decode the number. You may be required to provide proof of purchase documentation to verify that you are an authorized user of the projector.

CHANGING THE PASSWORD

1. Open the OSD menu and go to the **SYSTEM SETUP: Advanced > Security Settings > Change Password** menu.
2. Press **MODE/ENTER**. The message '**INPUT CURRENT PASSWORD**' displays.
3. Enter the old password.
 - If the password is correct, another message '**INPUT NEW PASSWORD**' displays.
 - If the password is incorrect, the password error message displays lasting for three seconds, and the message '**INPUT CURRENT PASSWORD**' displays for your retry. You can press **MENU/EXIT** to cancel the change or try another password.
4. Enter a new password.

NOTE

The digits being input will display as asterisks on-screen. Write your selected password down here in this user manual in advance or right after the password is entered so that it is available to you should you ever forget it.

Password: _____

Keep this user manual in a safe place.

CHANGING THE PASSWORD (Cont)

5. Confirm the new password by re-entering the new password.
6. You have successfully assigned a new password to the projector. Remember to enter the new password next time the projector is started.
7. To leave the OSD menu, press **MENU/EXIT**.

DISABLING THE PASSWORD FUNCTION

To disable password protection, go back to the **SYSTEM SETUP: Advanced > Security Settings > Power On Lock** menu after opening the OSD menu system. Select **Off** by pressing **◀/▶**. The message **'INPUT PASSWORD'** displays. Enter the current password.

- If the password is correct, the OSD menu returns to the **Security Settings** page with **'Off'** shown in the row of **Power On Lock**. You will not have to enter the password next time you turn on the projector.
- If the password is incorrect, the password error message displays lasting for three seconds, and the message **'INPUT PASSWORD'** displays for your retry. You can press **MENU/EXIT** to cancel the change or try another password.

NOTE

Though the password function is disabled, you need to keep the old password in hand should you ever need to re-activate the password function by entering the old password.

NAVIGATING THE ON-SCREEN DISPLAY (OSD) MENU

The OSD menus can be navigated through the on-board projector keypad or via the remote control.

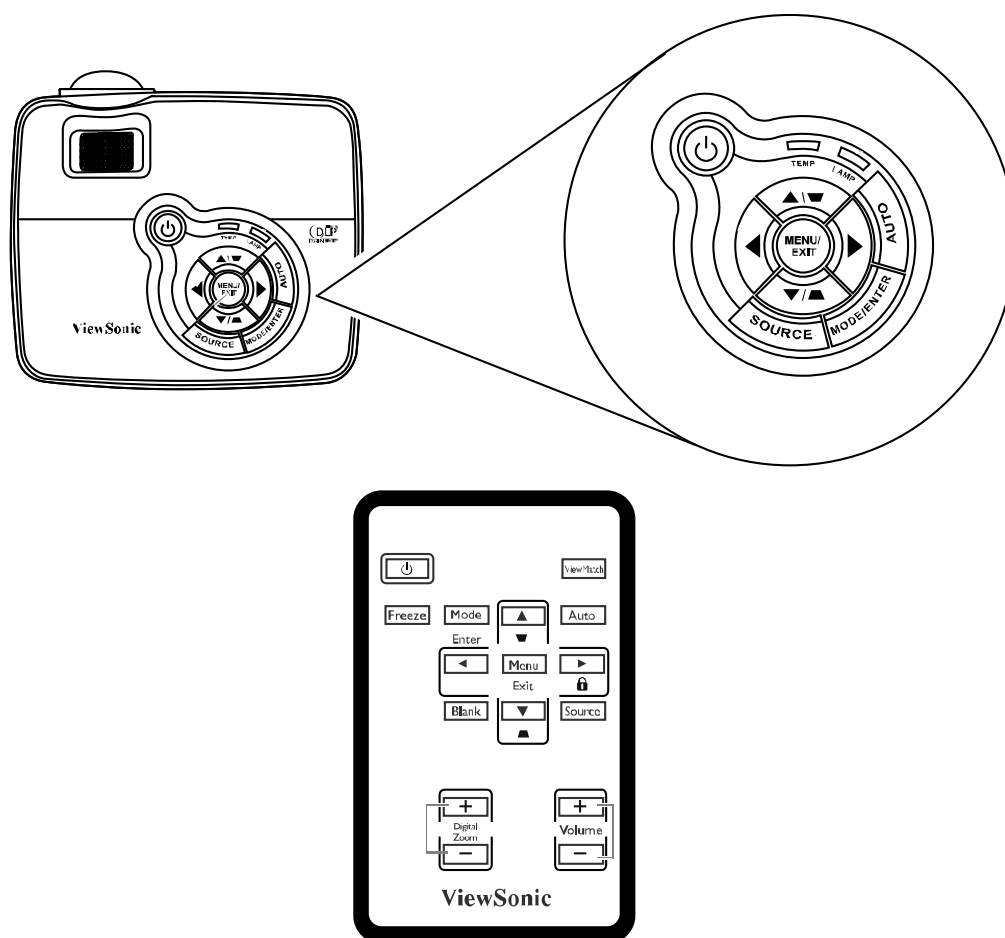


Figure 28. Navigating On-Board Projector Keypad or Remote Control

Table 28. On-Board Keypad or Remote Control Functions.

FUNCTION	DESCRIPTION
MENU/EXIT	Turns on the On-Screen Display (OSD) menu. Goes back to previous OSD menu, exits and saves menu settings.
□/▲/△/▼ KEystone/ARROW KEYS	Manually corrects distorted images resulting from angled projection
▲ / ▼ ARROWS	Navigates up or down in menu.
◀ / ▶ ARROWS	Moves between top level menus. Changes, or toggles adjustable values. Enters or exits sub-menus.
⏻ POWER	Switches the projector between on and standby modes.

SWITCHING INPUT SIGNAL

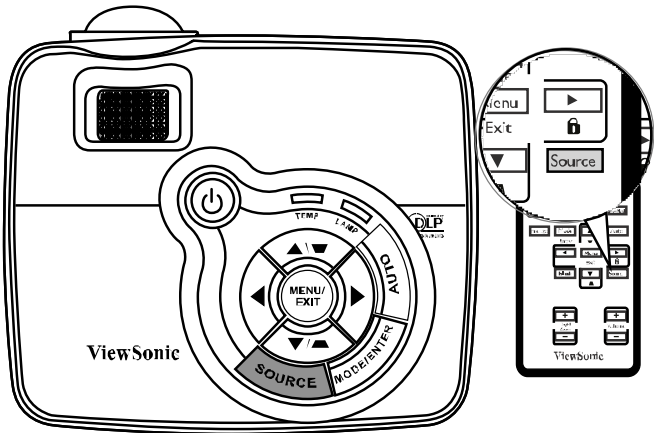
The projector can be connected to multiple devices at the same time. However, it can only display one full screen at a time.

Ensure the **Quick Auto Search** function in the **SOURCE** menu is **On** (projector default) and the projector will automatically search for the signals.

To manually cycle through the available input signals, follow the following procedures:

- 1. Press **SOURCE** on the projector or remote control. A source selection bar displays.
- 2. Press **▲/▼** until your desired signal is selected and press **MODE/ENTER**.

Once detected, the selected source information will display on the screen for seconds. If there are multiple devices connected to the projector, repeat steps 1 and 2 to search for another signal.



	D-Sub / Comp. 1
	D-Sub / Comp. 2
	Video
	S-Video

Figure 29. Switching Input Signal

SWITCHING INPUT SIGNAL (Cont)**NOTE**

The brightness level of the projected image will change accordingly when you switch between different input signals. Data (graphic) "PC" presentations using mostly static images are generally brighter than "Video" using mostly moving images (movies).

The input signal type effects the options available for the Preset Mode. See "Selecting a picture mode" on page 26 for details.

The native display resolution of this projector is 4:3 aspect ratio. For best picture display results, select and use an input signal which outputs at this resolution. Any other resolutions will be scaled by the projector depending upon the 'aspect ratio' setting, which may cause some image distortion or loss of picture clarity. See "Selecting the aspect ratio" on page 24 for details

AUTO-ADJUSTING THE IMAGE

In some cases, you may need to optimize the picture quality. To do this, press **AUTO** on the projector or remote control. Within 3 seconds, the built-in Intelligent Auto Adjustment function will re-adjust the values of Frequency and Clock to provide the best picture quality. The current source information will be displayed in the upper left corner of the screen for 3 seconds. The screen will be blank when AUTO is selected.

NOTE

This function is only available when PC signal (analog RGB) is selected.

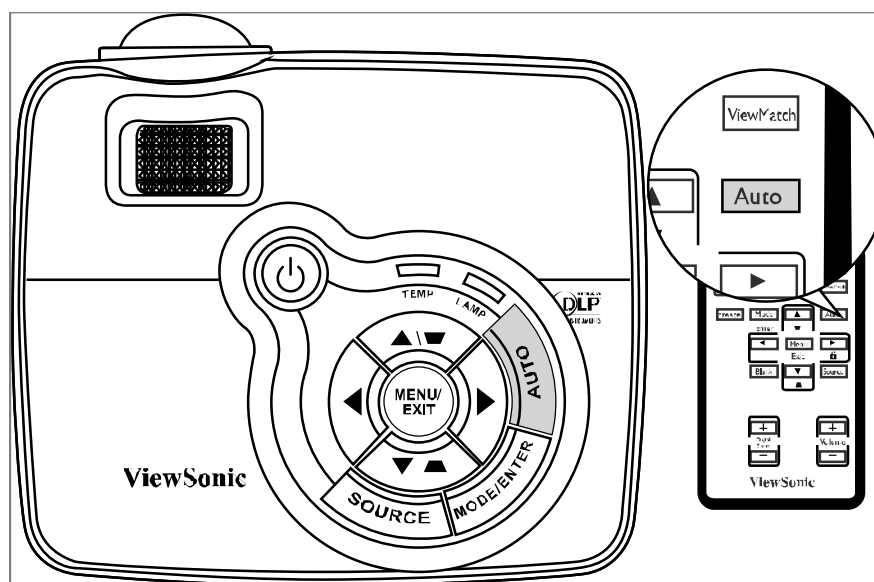


Figure 30. Auto-Adjusting the Image.

IMAGE CLARITY

Sharpen the image by rotating the focus ring on the projector.

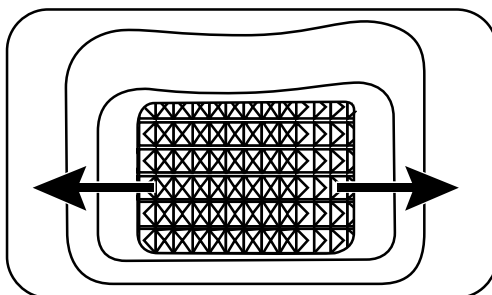
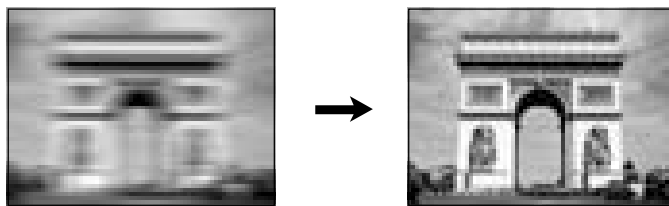


Figure 31. Image Clarity.

CORRECTING KEYSTONE

Keystone correction refers to when the projected image is noticeably wider at either the top or bottom. It occurs when the projector is not perpendicular to the screen. To correct this, besides adjusting the height or side to side of the projector as previously discussed in WP 0007, page 11, Keystone correction may be obtained following one of these procedures.

USING THE REMOTE CONTROL FOR KEYSTONE CORRECTION

1. Press $\square / \triangle$ on the projector or remote control to display the Keystone correction page.
2. Press $\square$ to correct keystone at the top of the image.
3. Press $\triangle$ to correct keystone at the bottom of the image.

Using the OSD Menu

1. Press **MENU/EXIT** and then press $\blacktriangleleft / \blacktriangleright$ until the **DISPLAY** menu is highlighted.
2. Press $\blacktriangledown$ to highlight **Keystone** and then press **MODE/ENTER**. The **Keystone** correction page displays.
3. Press $\square$ to correct **Keystone** at the top of the image or press $\triangle$ to correct **Keystone** at the bottom of the image.

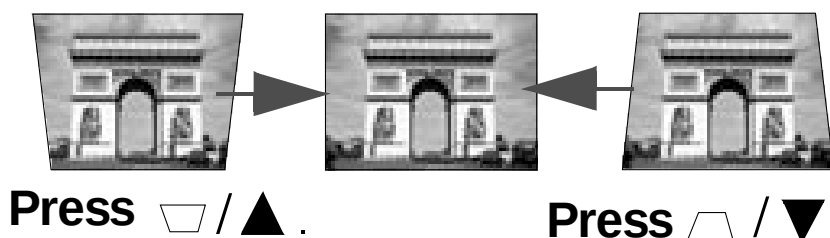
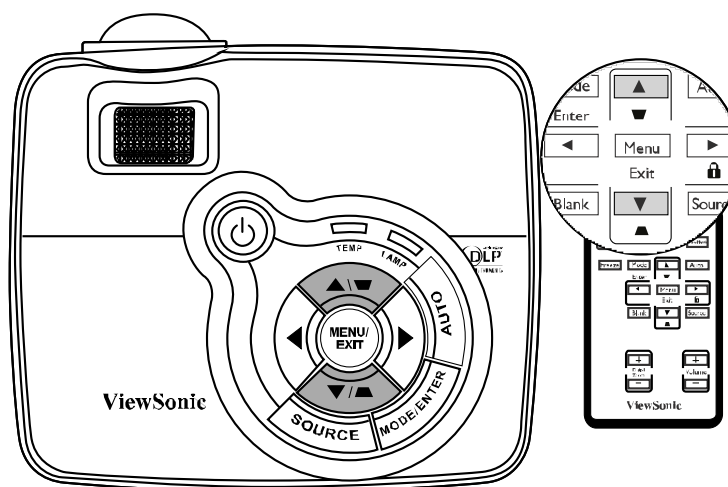


Figure 32. Correcting Keystone.

MAGNIFYING IMAGE DETAILS

To find details of the projected image, or to magnify the image, use the direction arrow keys on the projector or remote control for navigating the picture.

USING THE REMOTE CONTROL

1. Press **Digital Zoom +/-** to display the Zoom bar.
2. Press **Digital Zoom +** to magnify the center of the picture. Press the key repeatedly until the picture size is suitable for your need.
3. Use the directional arrows (**▲**, **▼**, **◀**, **▶**) on the projector or remote control to navigate the picture.
4. To restore the picture to its original size, press the **AUTO** button or press the **Digital Zoom -**. When the key is pressed again, the picture is further reduced until it is restored to the original size.

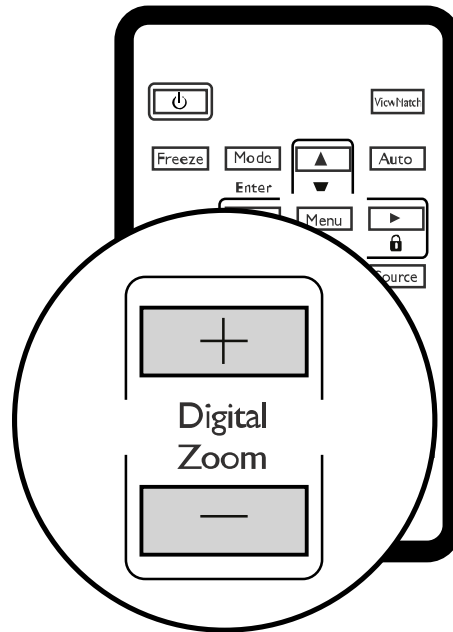


Figure 33. Magnifying Image.

USING THE OSD MENU

1. Press **MENU/EXIT** and then press **◀/▶** until the **DISPLAY** menu is highlighted.
2. Press **▼** to highlight **Digital Zoom** and then press **MODE/ENTER**. The Zoom bar displays.
3. Repeat steps 2-4 in the above section of "Using the remote control". Or if using the projector control panel, continue to the following steps.
4. Press **▲** on the projector repeatedly to magnify the picture to a desired size.
5. To navigate the picture, press **MODE/ENTER** to switch to the panning mode and press the directional arrows (**▲**, **▼**, **◀**, **▶**) to navigate the picture.

MAGNIFYING IMAGE DETAILS (Cont)

6. Use the directional arrows (▲, ▼, ◀, ▶) on the projector or remote control to navigate the picture.
7. To reduce size of the picture, press **MODE/ENTER** to switch back to the zoom in/out functionality, and press **AUTO** to restore the picture to its original size. Press ▼ key repeatedly until image is restored to the original size.

NOTE

The picture can only be navigated after the picture is magnified. You can further magnify the picture while searching for details.

ASPECT RATIO

The 'aspect ratio' is the ratio of the image width to the image height. Most analog TV and computers are in 4:3 ratio, which is the default for this projector, and digital TV and DVDs are usually in 16:9 ratio. See Figure 35 for more information pertaining to aspect ratio.

With the advent of digital signal processing, digital display devices like this projector can dynamically stretch and scale the image output to a different aspect than that of the image input signal.

SELECTING THE ASPECT RATIO

To change the projected aspect ratio using the projector key pad or remote control (no matter what aspect the source is) use the following procedures.

1. Press **MENU/EXIT** and then press ◀/▶ until the **DISPLAY** menu is highlighted.
2. Press ▼ to highlight **Aspect Ratio**.
3. Press ◀/▶ to select an aspect ratio to suit the format of the video signal and your display requirements.

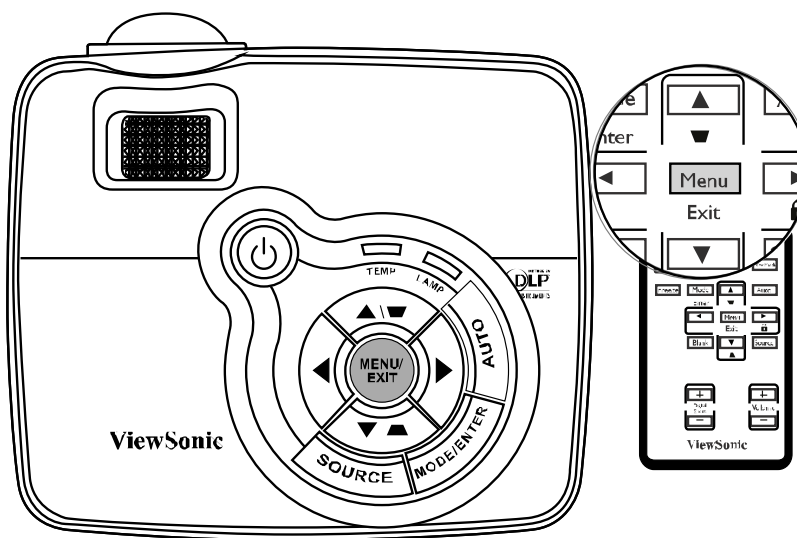


Figure 34. Selecting Aspect Ratio.

ABOUT THE ASPECT RATIO

In Figure 35, the black portions are inactive areas and the white portions are active areas. The OSD menus can be displayed on those unused black areas.

1. **Auto:** Scales an image proportionally to fit the projector's native resolution in its horizontal width. This is suitable for the incoming image which is neither in 4:3 nor 16:9 and you want to make the most use of the screen without altering the image's aspect ratio.
2. **4:3:** Scales an image so that it is displayed in the center of the screen with a 4:3 aspect ratio. This is most suitable for 4:3 image like computer monitors, standard definition TV and 4:3 aspect DVD movies, as displays them without aspect alteration.
3. **16:9:** Scales an image so that it is displayed in the center of the screen with 16:9 aspect ratio. This is most suitable for images which are already in a 16:9 aspect, like high definition TV, as it displays them without aspect alteration.

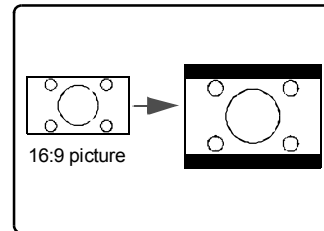
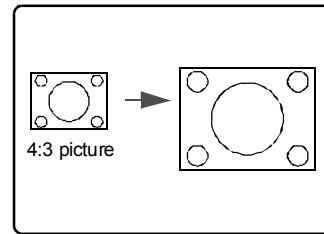
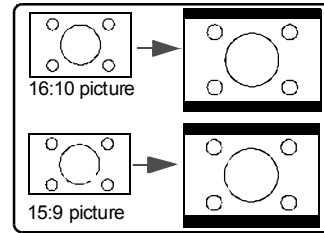


Figure 35. Aspect Ratio

OPTIMIZING THE IMAGE

SELECTING A PICTURE MODE

The projector is preset with several predefined picture modes so that you can choose one to suit your operating environment and input signal picture type.

To select an operation mode that suits your need, you can follow one of the following steps.

1. Press **MODE/ENTER** (see Figure 34) on the remote control or projector repeatedly until your desired mode is selected.
2. Go to the **PICTURE > Preset Mode** menu and press ◀/▶ to select a desired mode.

Picture Modes for Different Types of Signals

The picture modes available for different types of signals are listed below.

PC Input Signals: D-Sub / Comp. 1/2 (Analog RGB)

1. **Brightest mode (Default):** Maximizes the brightness of the projected image. This mode is suitable for environments where extra-high brightness is required, such as using the projector in well lit rooms.
2. **Daylight mode:** Is designed for presentations under daylight environment to match PC and notebook coloring.
3. **View-Match mode:** Switch in between high brightness performance or Accuracy color performance.
4. **Cinema mode:** Is appropriate for playing colorful movies, video clips from digital cameras or DVDs through the PC input for best viewing in a blackened (little light) environment.
5. **User 1/User 2 mode:** Recalls the settings customized based on the current available picture modes. See "Setting the User 1/User 2 mode" below for details.

Video Input Signals: S-Video, Video, D-Sub / Comp. 1/2 (YPbPr)

1. **Brightest mode:** Is suitable for playing game box-based video games in a normal living room lighting level environment.
2. **Standard mode (Default):** Is appropriate for viewing colorful movies, video clips from digital cameras or DVDs.
3. **Cinema mode:** Is suitable for enjoying dark movies or DVD movies best viewed in a blackened (little light) home cinema or lounge room environment.
4. **User 1/User 2 mode:** Recalls the settings customized based on the current available picture modes. See "Setting the User 1/User 2 mode" below for details

SETTING THE USER 1/USER 2 MODE

There are two user-definable modes if the current available picture modes are not suitable for your need. You can use one of the picture modes (except the **User 1/User 2**) as a starting point and customize the settings.

SETTING THE USER 1/USER 2 MODE (Cont)

1. Press **MENU/EXIT** (see Figure 34) to open the On-Screen Display (OSD) menu.
2. Go to the **PICTURE > Preset Mode** menu.
3. Press **◀/▶** to select **User 1** or **User 2**.
4. Press **▼** to highlight **Reference Mode**.

NOTE

This function is only available when User 1 or User 2 mode is selected up in the Preset Mode sub-menu item.

5. Press **◀/▶** to select a picture mode that is closest to your need.
6. Press **▼** to select a sub-menu item to be changed and adjust the value with **◀/▶**. See "Fine-tuning the image quality in user modes", WP 0007, page 33 for details.
7. When all settings have been done, highlight **Save Settings** and press **MODE/ENTER** to store the settings.
8. The confirmation message '**Setting Saved**' displays.

USING SCREEN COLOR**NOTE**

This function is only available when a PC type input signal is selected.

In the situation where you are projecting onto a colored surface such as a painted wall which may not be white, the **Screen Color** feature can help correct the projected picture's colors to prevent possible color difference between the source and projected pictures.

To use this function, go to the **DISPLAY > Screen Color** menu and press **◀/▶** to select a color which is closest to the color of the projection surface. There are several pre-calibrated colors to choose from: **Whiteboard**, **Greenboard**, and **Blackboard**.

FINE-TUNING THE IMAGE QUALITY IN USER MODES

According to the detected signal type, there are some user-definable functions available when **User 1** or **User 2** mode is selected. You can make adjustments to these functions based on your needs.

ADJUSTING BRIGHTNESS

1. Press **MENU/EXIT** (see Figure 34) to open the On-Screen Display (OSD) menu.
2. Highlight the **PICTURE > Brightness** menu and press **◀/▶**.

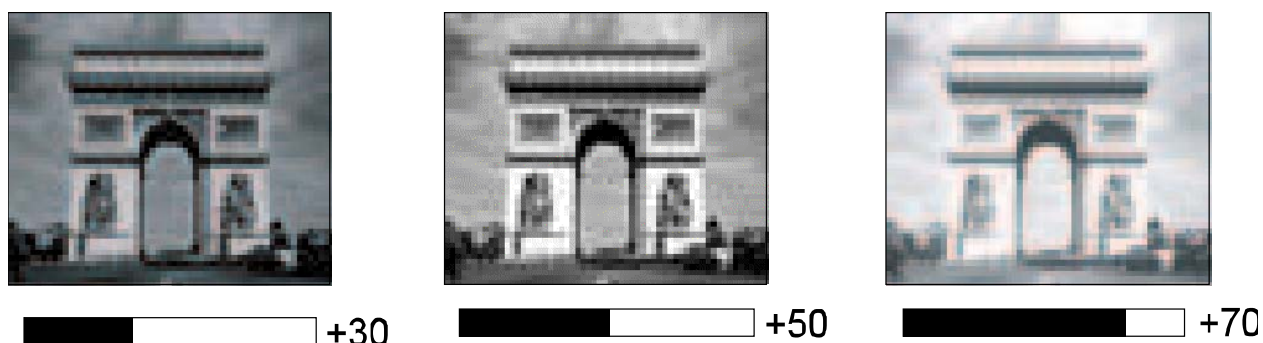


Figure 36. Adjusting Brightness.

The higher the value, the brighter the image will be; the lower the setting, the darker the image will be. Adjust this control so the black areas of the image appear just as black and that detail in the dark areas is visible.

3. When all settings have been done, highlight **Save Settings** and press **MODE/ENTER** to store the settings.

ADJUSTING CONTRAST

1. Press **MENU/EXIT** (see Figure 34) to open the On-Screen Display (OSD) menu.
2. Highlight the **PICTURE > Contrast** menu and press **◀/▶**.

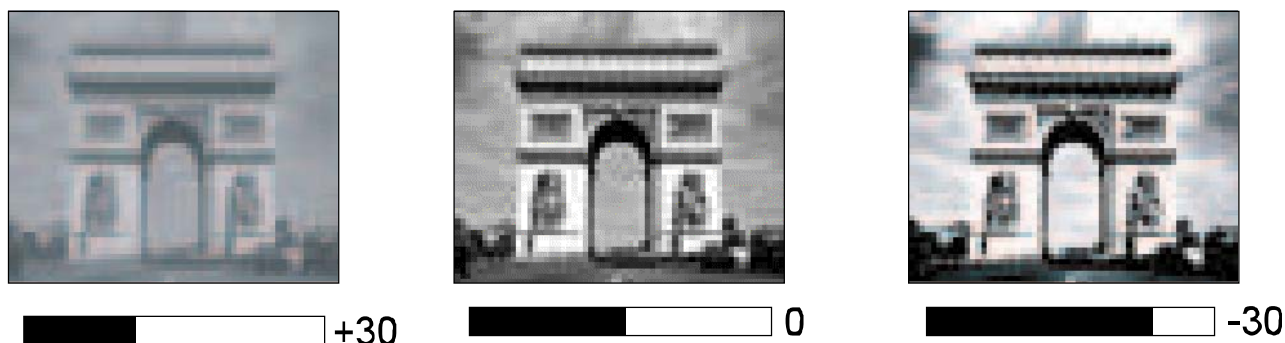


Figure 37. Adjusting Contrast.

The higher the value, the greater the contrast will become. Use this to set the peak white level after you have previously adjusted the **Brightness** setting to suit your selected input and viewing environment.

3. When all settings have been done, highlight **Save Settings** and press **MODE/ENTER** to store the settings.

ADJUSTING COLOR

Highlight the **PICTURE > Color** menu and press ◀/▶.

Lower setting produces less saturated colors. If the setting is too high, colors on the image will be overpowering, which makes the image unrealistic.

ADJUSTING TINT

Highlight the **PICTURE > Tint** menu and press ◀/▶.

The higher the value, the more reddish the picture becomes. The lower the value, the more greenish the picture becomes.

ADJUSTING SHARPNESS

Highlight the **PICTURE > Sharpness** menu and press ◀/▶.

The higher the value, the sharper the picture becomes. The lower the value, the softer the picture becomes.

ADJUSTING BRILLIANT COLOR

Highlight the **PICTURE > Brilliant Color** menu and press ◀/▶.

This feature utilizes a new color-processing algorithm and system level enhancements to enable higher brightness while providing truer, more vibrant colors in the projected picture. It enables a greater than 50% brightness increase in mid-tone images, which are common in video and natural scenes, so the projector reproduces images in realistic and true colors. If you prefer images with that quality, select **On**. If you don't need it, select **Off**.

On is the default and recommended selection for this projector. When **Off** is selected, the **Color Temperature** function is not available.

SELECTING A COLOR TEMPERATURE

Highlight the **PICTURE > Color Temperature** menu and press ◀/▶.

The options available for color temperature* settings vary according to the signal type selected.

1. **T1:** With the highest color temperature, T1 makes the image appear the most bluish white than other settings.
2. **T2:** Makes images appear bluish white.
3. **T3:** Maintains normal colorings for white.
4. **T4:** Makes images appear reddish white.

*ABOUT COLOR TEMPERATURES:

There are many different shades that are considered to be "white" for various purposes. One of the common methods of representing white color is known as the "color temperature". A white color with a low color temperature appears to be reddish white. A white color with a high color temperature appears to have more blue in it.

HIDING THE IMAGE

CAUTION

Do not block the projection lens from projecting as this could cause the blocking object to become heated and deformed or even cause a fire.

In order to draw the audience's full attention to the presenter, you can use ◀ on the projector or **BLANK** on the remote control to hide the screen image. Press any key on the projector or remote control to restore the image. The word '**BLANK**' appears at the lower right corner of the screen while the image is hidden.

You can set the blank time in the **SYSTEM SETUP: Basic > Blank Timer** menu to let the projector return the image automatically after a period of time when there is no action taken on the blank screen.

NOTE

Once **BLANK** is pressed, the projector enters **Economic** mode automatically.

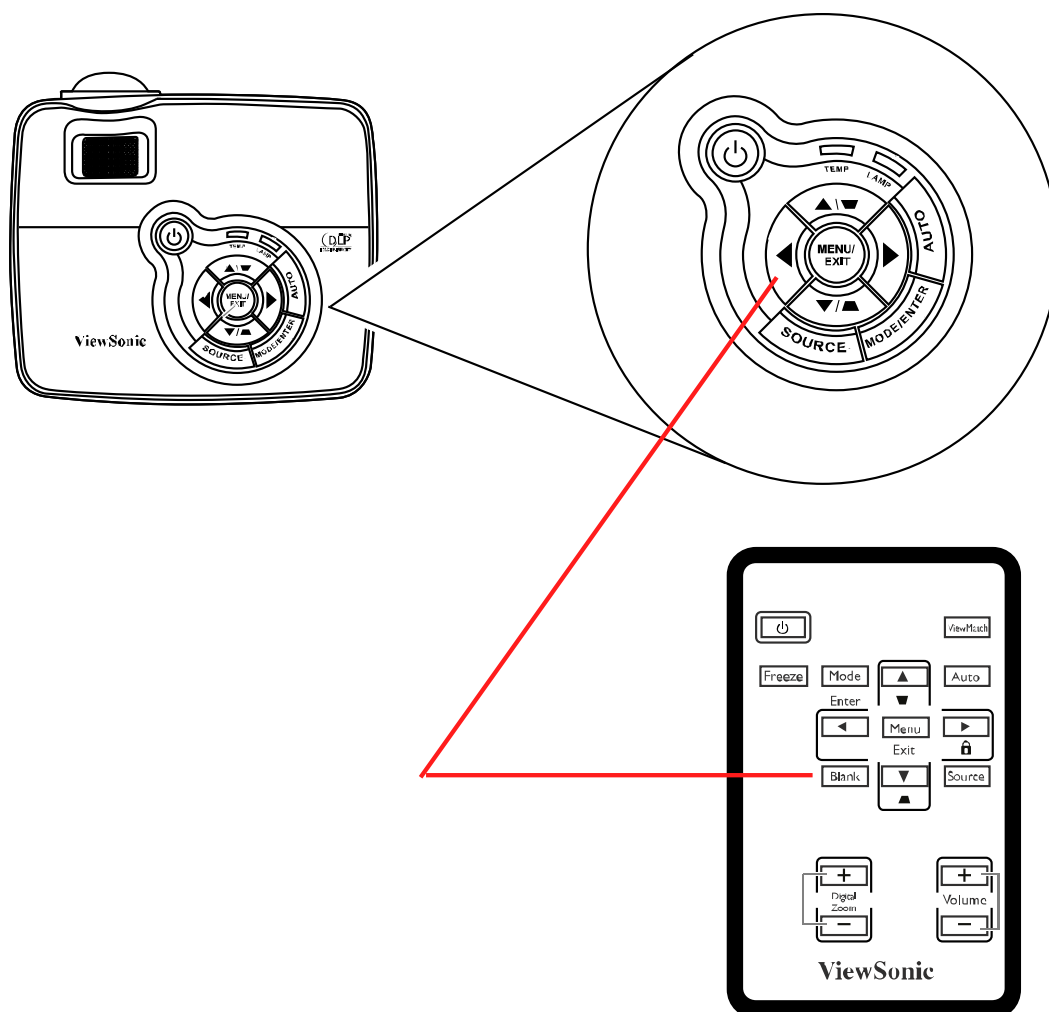


Figure 38. Hiding the Image.

LOCKING CONTROL KEYS

With the control keys on the projector locked, you can prevent your projector settings from being changed accidentally. When the **Panel Key Lock** is on, no control keys on the projector will operate except  **POWER**.

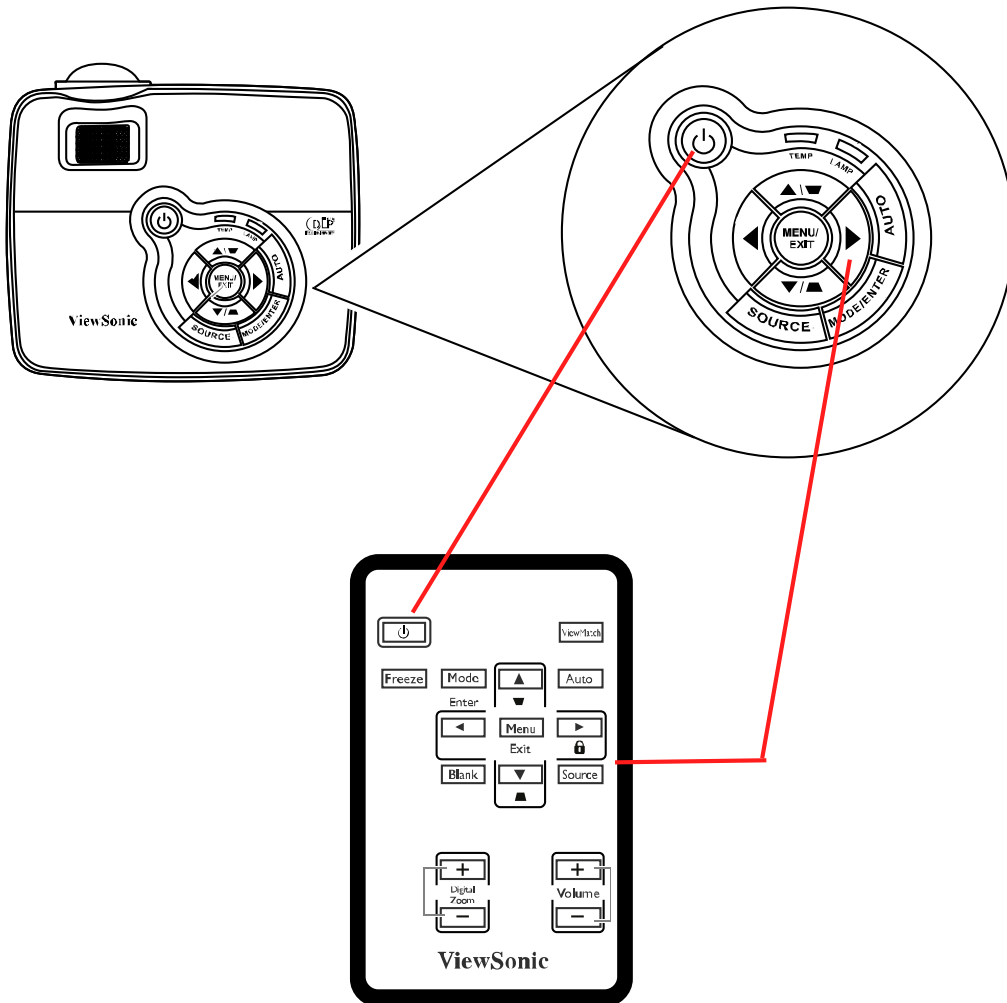


Figure 39. Locking Control Keys

1. Press  /  on the projector or remote control or go to the **SYSTEM SETUP: Basic > Panel Key Lock** menu, and select **On** by pressing  /  on the projector or remote control.
2. A confirmation message displays. Select **Yes** to confirm.
3. To release panel key lock, press and hold  /  for 3 seconds on the projector or remote control.

You can also use the remote control to enter the **SYSTEM SETUP: Basic > Panel Key Lock** and press  /  to select **Off**.

LOCKING CONTROL KEYS (Cont)**NOTE**

Keys on the remote control are still functional when panel key lock is enabled.

If you press  POWER to turn off the projector without disabling panel key lock, the projector will still be in locked status the next time it is turned on.

FREEZING THE IMAGE

Press **FREEZE** as shown in Figure 40 on the remote control to freeze the image. The word '**FREEZE**' will display in the upper left corner of the screen. To release the function, press any key on the projector or remote control.

Even if an image is frozen on the screen, the pictures are running on the video or other device. If the connected devices have active audio output, you will still hear the audio even though the image is frozen on screen.

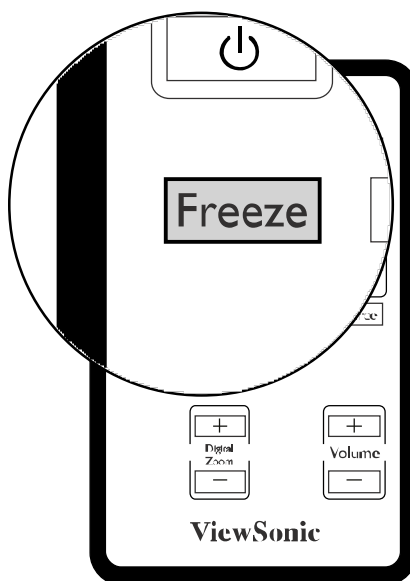


Figure 40. Freezing the Image.

ADJUSTING THE SOUND

The sound adjustments made below will have an effect on the projector speaker. Be sure you have made a correct connection to the projector audio input. See "Connection" in this WP on page 3 for how the audio input is connected.

MUTING THE SOUND

To temporarily turn off the sound follow these procedures:

1. Press **MENU/EXIT** on the remote control or projector (see Figure 34) and then press **◀/▶** until the **SYSTEM SETUP: Advanced** menu is highlighted.
2. Press **▼** to highlight **Audio Settings** and press **MODE/ENTER**. The **Audio Settings** page displays.
3. Highlight **Mute** and press **◀/▶** to select **On**.

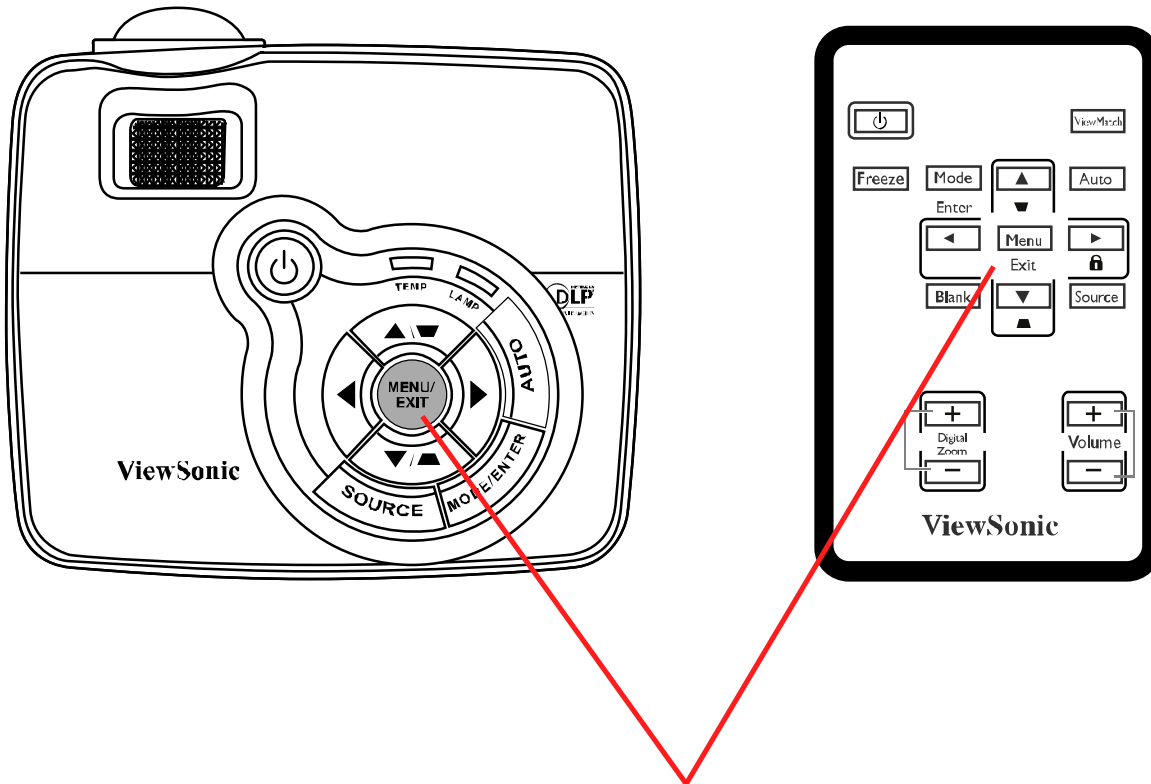


Figure 41. System Setup: Advanced Menu.

ADJUSTING THE SOUND LEVEL

To adjust the sound level, press **Volume +/-** on the remote control, or:

1. Repeat steps 1-2 above.
2. Press **▼** to highlight **Volume** and press **◀/▶** to select a desired sound level

PERSONALIZING PROJECTOR MENU DISPLAY

The On-Screen Display (OSD) menus can be set according to your preferences. The following settings do not affect the projection settings, operation, or performance.

- **Menu Display Time** in the **SYSTEM SETUP: Advanced > Menu Settings** menu sets the length of time the OSD will remain active after your last key press. The time length ranges from 5 to 30 seconds in 5-second increments. Use ◀/▶ to select a suitable time frame.
- **Menu Position** in the **SYSTEM SETUP: Advanced > Menu Settings** menu sets the OSD position in five locations. Use ◀/▶ to select a preferred position.
- **Language** in the **SYSTEM SETUP: Basic** menu sets your familiar language for the OSD menus. Use ◀/▶ to select your language.
- **Splash Screen** in the **SYSTEM SETUP: Basic** menu sets a preferred logo screen to be displayed during projector start-up. Use ◀/▶ to select a screen.

OPERATING IN HIGH ALTITUDE ENVIRONMENT

We recommend you use the **High Altitude Mode** when your environment is between 4,921ft – 9,842ft (1500m -3000m) above sea level and temperature is between 32°F / -31°F (0°C / 35°C).

CAUTION

**Do not use the High Altitude Mode if your altitude is between 0ft and 4,921ft (0m and 1500m) and temperature is between 32°F and 95°F (0°C and 35°C).
The projector will be over cooled, if you turn the mode on under such a condition**

To activate the **High Altitude Mode**:

1. Press **MENU/EXIT** and then press ◀/▶ until the **SYSTEM SETUP: Advanced** menu is highlighted.
2. Press ▼ to highlight **High Altitude Mode** and press ◀/▶ to select **On**. A confirmation message displays as shown in Figure 35.

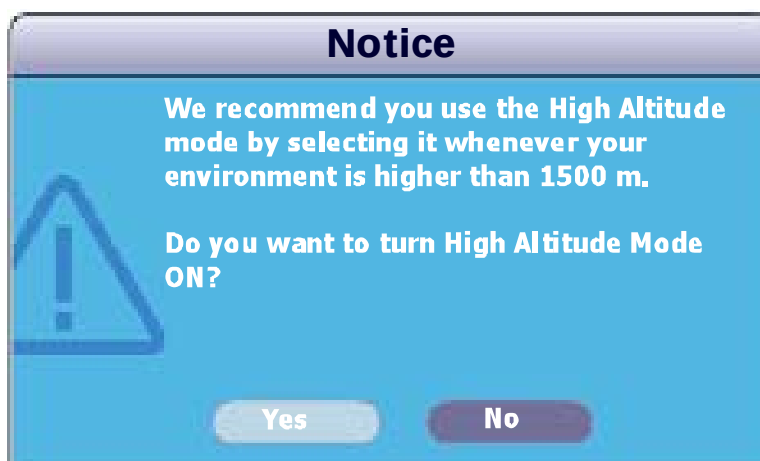


Figure 42. High Altitude Mode Confirmation Message

OPERATING IN HIGH ALTITUDE ENVIRONMENT (Cont)

3. Highlight **Yes** and press **MODE/ENTER** to confirm High Altitude Mode.

NOTE

Operation under "**High Altitude Mode**" may cause a higher decibel operating noise level because of increased fan speed necessary to improve overall system cooling and performance.

If you use this projector under other extreme conditions excluding the above, it may display auto shut-down symptoms, which is designed to protect your projector from over-heating. In cases like this, you should switch to **High Altitude Mode** to solve these symptoms. However, this is not to state that this projector can operate under any and all harsh or extreme conditions.

SHUTTING DOWN THE PROJECTOR

1. Press  **POWER** and a confirmation message display prompting you to confirm. If you don't respond in a few seconds, the message will disappear.
2.  Press **POWER** a second time. The **POWER indicator light** flashes blue, the projection lamp shuts down and the fan will continue to run for approximately 90 seconds to cool down the projector.
3. Disconnect the power cord if the projector will not be used in an extended period of time.

CAUTION

- To protect the lamp, the projector will not respond to any commands during the cooling process.
- To shorten the cooling time, you can also activate the Quick Cooling function. See "Quick Cooling" in WP 0008, on page 6 for details.
- Do not unplug the power cord before the projector shutdown sequence is complete or during the 90-second cooling down process.
- If the projector is not properly shut down, to protect the lamp, when you attempt to re-start the projector, the fans will run for a few minutes to cool down. Press  **POWER** again to start the projector after the fans stop and the **POWER indicator light** flashes blue.

LAMP INFORMATION**GETTING TO KNOW THE LAMP HOUR**

When the projector is in operation, the duration (in hours) of lamp usage is automatically calculated by the built-in timer. The method of calculating the equivalent lamp hour is as follows:

Total (equivalent) lamp hour
= 1 (hours used in **Economic** mode) + 3/4 (hours used in **Normal** mode).

GETTING TO KNOW THE LAMP HOUR (Cont)**NOTE**

See "Setting Lamp mode as Economic" below for more information on Economic mode.

The lamp hour in **Economic** mode is calculated as 3/4 of that in **Normal** mode. That is, using the projector in **Economic** mode helps to extend the lamp hour by 1/3.

To obtain the lamp hour information:

1. Press **MENU/EXIT** and then press **◀/▶** until the **SYSTEM SETUP: Advanced** menu is highlighted.
2. Press **▼** to highlight **Lamp Settings** and press **MODE/ENTER**. The **Lamp Settings** page displays.
3. You will see the **Equivalent lamp hour** information displaying on the menu.
4. To leave the menu, press **MENU/EXIT**.

You can also get the lamp hour information on the **INFORMATION** menu.

EXTENDING LAMP LIFE

The projection lamp is a consumable item that normally can last up to 3000-4000 hours with proper usage. To keep the lamp life as long as possible, you can do the following settings via the OSD menu.

SETTING LAMP MODE AS ECONOMIC

Using **Economic** mode reduces system noise and power consumption by 20%. If the **Economic** mode is selected, the light output will be reduced and result in darker projected pictures.

Setting the projector in **Economic** mode also extends the lamp operation life. To set **Economic** mode, go into the **SYSTEM SETUP: Advanced > Lamp Settings > Lamp mode** menu and press **◀/▶**.

SETTING AUTO POWER OFF

This function allows the projector to turn off automatically if no input source is detected after a set period of time to prevent unnecessary waste of lamp life.

To set **Auto Power Off**, go into the **SYSTEM SETUP: Basic > Auto Power Off** menu and press **◀/▶**. The time period can be set from 5 to 30 minutes in 5-minute increments. If the preset time lengths are not suitable for your presentation, select **Disable**. The projector will not automatically shut down in a certain time period.

TIMING OF REPLACING THE LAMP

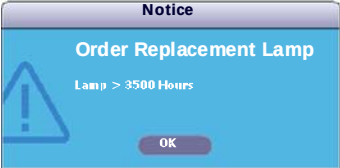
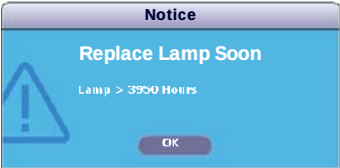
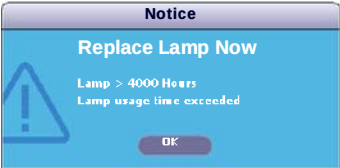
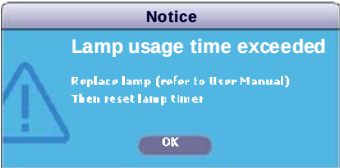
When the **Lamp indicator** lights up red or a message appears suggesting it is time to replace the lamp, please install a new lamp or contact DHS Systems. An old lamp may cause a malfunction in the projector and in some instances the lamp may explode.

CAUTION

The Lamp indicator light and Temperature warning light will light up if the lamp becomes too hot. Turn the power off and let the projector cool for 45 minutes. If the Lamp or Temp indicator still lights up after turning the power back on, please contact DHS Systems. See "Indicators Table" in WP 0012, on page 7 for details.

The following lamp warning displays will remind you to change the lamp.

Table 43. Replacing Lamp Message.

STATUS	MESSAGE
The lamp has been in operation for 3500 hours. Install a new lamp for the optimal performance. If the projector is normally run with Economic selected (see "Setting Lamp Mode as Economic on page 41) you may continue to operate the projector until the 3950 hour lamp warning appears.	
The lamp has been operation for 3950 hours. A new lamp should be fitted to avoid the inconvenience when the projector runs out of lamp hours.	
The lamp has been in operation for 4000 hours. It is strongly recommended that you replace the lamp this age. The lamp is a consumable item. The lamp brightness diminishes with use. This is normal lamp behavior. You can replace the lamp whenever you notice that the brightness diminishes. If the lamp is not replaced beforehand, it must be replaced after 4000 hours.	
The lamp MUST be replaced before the projector will operate normally.	

END OF TASK

END OF WORK PACKAGE

**OPERATOR INSTRUCTIONS
MEDIUM XGA PROJECTION SYSTEM
PROJECTOR SOFTWARE**

GENERAL

This work package describes the operating screens found on the DC2E Medium XGA Projection System and Remote Control.

NAVIGATING THE ON-SCREEN DISPLAY MENU SYSTEM

The on-screen display (OSD) menu system can be navigated through the keypad on top of the projector or via the remote control.

NOTE

The On-Screen Display (OSD) menus vary according to the signal type selected.

The menu items are available when the projector detects at least one valid signal. If there is no equipment connected to the projector or no signal detected, limited menu items are accessible.

See WP 0004, Description and Use of Controls, Indicators and Connections for keypad and remote control functions.

MENU SYSTEM

Main Menu	Sub-menu	Options
1. DISPLAY	Screen Color Aspect Ratio Keystone Position Phase H. Size Digital Zone	OFF / Whiteboard / Greenboard / Blackboard Auto / 4:3 / 16:9
2. PICTURE	Preset Mode Reference Mode Brightness Contrast Color Tint Sharpness Brilliant Color Color Temperature Save Settings	PC source: Brightest / Daylight / View-Match / Cinema / User 1 / User 2 Video source: Brightest / Standard / Cinema / User 1 / User 2 PC source: Brightest / Daylight / View-Match / Cinema Video source: Brightest / Standard / Cinema On / Off T1 / T2 / T3 / T4
3. SOURCE	Quick Auto Search	On / Off
4. SYSTEM SETUP: Basic	Language Projector Position Auto Power Off Blank Timer Panel Key Lock Timer Controller Splash Screen	English / French / German / Italian / Spanish / Russian / Swedish / Dutch / Turkish / Finnish / Czech / Persian / Polish / Japanese / Chinese / Korean / Portuguese Front Table / Rear Table / Rear Ceiling / Front Ceiling Disable / 5 min / 10 min / 15 min / 20 min / 25 min / 30 min Disable / 5 min / 10 min / 15 min / 20 min / 25 min / 30 min On / Off Disable / 30 min / 1 hr / 2 hr / 3 hr / 4 hr / 8 hr / 12 hr Black / Blue / ViewSonic

MENU SYSTEM (Cont)

Main Menu	Sub-menu	Options
5. SYSTEM SETUP: Advanced	Quick Cooling	On / Off
	High Altitude Mode	On / Off
	DCR	On / Off
	Active VGA Out	On / Off
	Audio Settings	Mute: On / Off
	Menu Settings	Volume: Menu Display Time: 5 sec / 10 sec / 15 sec / 20 sec / 25 sec / 30 sec
	Closed Caption	Menu Position: Center / Top-Left / Top-Right / Bottom-Left / Bottom-Right Closed Caption Enable: On / Off
	Lamp Settings	Caption Version: CC1 / CC2 / CC3 / CC4 Lamp Mode: Normal / Economic
6. INFORMATION		Reset Lamp Timer
	Security Settings	Equivalent Lamp Hour Change Password
	Reset All Settings	Power On Lock On / Off
	Current System Status	Source Preset Mode Resolution Color System Equivalent Lamp Hour

DESCRIPTION OF EACH MENU

Menu	Function (default setting / value)	Description (default setting / value)
1. DISPLAY Menu	Screen Color (Off)	Corrects the projected picture's color when the projection surface is not white. See "Using Screen Color", WP 0007, page 32 for details
	Aspect Ratio (Auto)	There are three options to set the image's aspect ratio depending on your input signal source. See "Selecting the aspect ratio", WP 0007, page 29 for details
	Keystone (0)	Corrects any keystone of the image. See "Correcting keystone", WP 0007, page 27 for details
	Position (0)	Displays the position adjustment page. To move the projected image, use the directional arrow keys. The values shown on the lower position of the page change with every key press you made until they reach their maximum or minimum
	Phase (depends on the selected input signal)	Adjusts the clock phase to reduce image distortion.
		
	H. Size (0) Digital Zoom (1.0X)	Adjusts the horizontal width of the image. Magnifies or reduces the projected image. See "Magnifying and searching for details" WP 0007, page 23 for details.
2. PICTURE Menu	Preset Mode (PC Source: Brightness Video Source: Standard)	Pre-defined picture modes are provided so you can optimize your projector image set-up to suit your program type. See "Selecting a picture mode", WP 0007, page 28 for details.
	Reference Mode (Brightest)	Selects a picture mode that most suits your need for the image quality and further fine-tunes the image based on the selections listed on the same page below. See "Setting the User 1/User 2 mode" WP 0007, page 31 and 32 for details
	Brightness (50)	Adjusts the brightness of the image. See "Adjusting Brightness", WP 0007, page 33 for details.
	Contrast (0)	Adjusts the degree of difference between dark and light in the image. See "Adjusting Contrast", WP 0007, page 33 for details.
	Color (0)	Adjusts the color saturation level -- the amount of each color in a video image. See "Adjusting Color", WP 0007, page 34 for details.

DESCRIPTION OF EACH MENU (Cont)

Menu	Function (default setting / value)	Description (default setting / value)
2. PICTURE Menu (Cont)	Tint (0)	Adjusts the red and green color tones of the image. See "Adjusting Tint", WP 0007, page 34 for details.
	Sharpness (15)	NOTE The function is only available when Video or S-Video with NTSC system is selected. Adjusts the image to make it look sharper or softer. See "Adjusting Sharpness", WP 0007, page 34 for details
	Brilliant Color (On)	Adjusts white peaking while maintaining correct color presentation. See "Adjusting Brilliant Color", WP 0007, page 34 for details.
	Color Temperature (T1)	See "Selecting a Color Temperature", WP 0007, page 34 for details.
	Save Settings	Saves the settings made for the User 1 or User 2 mode.
3. SOURCE Menu	Quick Auto Search (On)	See "Switching Input Signal", WP 0007, page 24 for details.
4. SYSTEM SETUP: Basic Menu	Language (English)	Sets the language for the On-Screen Display (OSD) menus. See "Using the Menus", WP 0007, page 17 and 18 for details.
	Projector Position (Front Table)	The projector can be installed on a ceiling or behind a screen, or with one or more mirrors.
	Auto Power Off (Disable)	Allows the projector to turn off automatically if no input signal is detected after a set period of time. See "Setting Auto Power Off", WP 0007, page 41 for details.
	Blank Timer (Disable)	Sets the image blank time when the Blank feature is activated, once elapsed the image will return to the screen. See "Hiding the Image", WP 0007, page 35 for details.
	Panel Key Lock (Off)	Disables or enables all panel key functions except  POWER on the projector and keys on the remote control. See "Locking Control Keys", WP 0007, page 36 for details.

DESCRIPTION OF EACH MENU (Cont)

Menu	Function (default setting / value)	Description (default setting / value)
4. SYSTEM SETUP: Basic Menu (Cont)	Time Controller (Disable)	Sets the auto-shutdown timer. The timer can be set to a value between 30 minutes and 12 hours.
	Splash Screen (ViewSonic Logo)	Allows you to select which logo screen will display during projector start-up. Three options are available: ViewSonic logo, Black screen, or Blue screen.
5. SYSTEM SETUP: Advanced Menu	Quick Cooling (On)	Selecting On enables the function and the projector cooling time will be shortened to a few seconds.
	High Altitude Mode (Off)	NOTE If you attempt to restart the projector right after the quick cooling process, it may not be turned on successfully and will rerun its cooling fans A mode for operation in high altitude areas. See "Operating in a High Altitude Environment", WP 0007, page 39 for details
	DCR (Off)	Enables or disables the DCR (Dynamic Contrast Ratio) function. Selecting On enables the function and the projector will automatically switch the lamp mode between normal and economic modes according to the input image detected. NOTE This function is only available when a PC source is in use.
	Active VGA Out (On)	WARNING After enabling DCR, frequent lamp mode switching may shorten lamp life and noise level will vary during operation. Outputs a VGA signal when the COMPUTER IN and COMPUTER OUT sockets are correctly connected to devices. See "Connecting a Monitor", WP 0007, page 4 for how to make the connection.
	Audio Settings	NOTE Enabling this function slightly increases the standby power consumption. Mute (Off) Volume (5) See "Adjusting the sound", WP 0007, page 38 for details.

DESCRIPTION OF EACH MENU (Cont)

Menu	Function (default setting / value)	Description (default setting / value)
5. SYSTEM SETUP: Advanced Menu (Cont)	Menu Settings	Menu Display Time (15 sec) Sets the length of time the OSD will remain active after your last key press. The range is from 5 to 30 seconds in 5-second increments. Menu Position (Center) Sets the On-Screen Display (OSD) menu position
	Closed Caption	Closed Caption Enable (Off) Activates the function by selecting On when the selected input signal carries closed captions. • Captions: An on-screen display of the dialogue, narration, and sound effects of TV programs and videos that are closed captioned (usually marked as "CC" in TV listings). NOTE Set your screen aspect ratio to 4:3. This function is not available when the aspect ratio is "16:9". This function is only available when a Composite video or S-Video input signal is selected and its system format is NTSC.
	Lamp Settings	Caption Version (CC1) Selects a preferred closed captioning mode. To view captions, select CC1, CC2, CC3, or CC4 (CC1 displays captions in the primary language in your area). Lamp Mode (Normal) See "Setting Lamp Mode as Economic" WP 0007, page 41 for details. Reset Lamp Timer See "Resetting the Lamp Timer", WP 0016, page 12 for details.
	Security Settings	Equivalent Lamp Hour See "Getting to know the Lamp Hour", WP 0007, page 40 for details on how the total lamp hour is calculated. See "Utilizing the Password Function", WP 0007, page 19 for details.
	Reset All Settings	Returns all settings to the factory preset values. NOTE The following settings will still remain: Phase, H. Size, User 1, User 2, Language, Projector Position, High Altitude Mode, Security Settings.

DESCRIPTION OF EACH MENU (Cont)

Menu	Function (default setting / value)	Description (default setting / value)
6. INFORMATION Menu	Current System Status	Source Shows the current signal source. Preset Mode Shows the selected mode in the PICTURE menu. Resolution Shows the native resolution of the input signal. Color System Shows input system format, NTSC, PAL, SECAM, or RGB. Equivalent Lamp Hour Displays the number of hours the lamp has been used.

END OF WORK PACKAGE

**OPERATOR INSTRUCTIONS
MEDIUM XGA PROJECTION SYSTEM
EQUIPMENT STORAGE PLAN**

GENERAL

Refer to Components of End Item (COEI), Work Package 0019 for illustrations and tables identifying and addressing the storage location for all equipment included with the Medium XGA Projection System.

END OF WORK PACKAGE

CHAPTER 3

OPERATOR INSTRUCTIONS

FOR

DC2E

MEDIUM XGA PROJECTION SYSTEM

**OPERATOR TROUBLESHOOTING PROCEDURES
MEDIUM XGA PROJECTION SYSTEM
OPERATOR TROUBLESHOOTING INDEX**

GENERAL

This WP contains a troubleshooting index of conditions/indications that may develop during maintenance or operation. Maintenance is limited to those failures that may be repaired at the operator level. The troubleshooting index identifies the condition/indication, followed by a column that identifies the work package and page(s) where troubleshooting procedures(s) may be found. These inspections and corrective actions should be performed in the order listed. The index is provided to assist in the quick location of a problem. The manual cannot list all condition/indications that may occur. If a condition or indication is encountered that is not listed or cannot be corrected by the corrective actions provided, notify the supervisor.

TROUBLESHOOTING INDEX

The most important step in troubleshooting is recognizing the conditions/indications and combination of conditions/indications. Use the corrective action for a given condition/ indication in the order listed. If the first repair attempt is unsuccessful, proceed to the next recommended corrective action to resolve the problem. If a fault is encountered that is not listed or that cannot be corrected by the corrective actions provided, notify the supervisor.

Except for the equipment in Table 1, refer to appropriate technical manual(s) for any accessory equipment. Table 1 is provided as a tool to maintain equipment in good operating condition and ready for its primary mission.

WARNING

High voltage and amperage present at electrical connections. Use caution when connecting and disconnecting any electrical connection to prevent injury to personnel and damage to equipment.

AC voltage (110/120 VAC), and current sufficient to cause serious injury or death is present at electrical connections. Ensure power is disconnected before servicing the Medium XGA Projection System.

CAUTION

If the Medium XGA Projection System suddenly loses power, ensure the main power circuit breaker is turned off prior to reapplying power to the system. The sudden power surge may damage the projector's internal circuitry.

Table 1. Operator Troubleshooting Index

ITEM	CONDITION/ INDICATION	WP
	MECHANICAL	
	VIDEO	
1	No Direct Video Feed from source available	WP 0012-2
2	No Direct Video Feed Output	WP 0012-2
3	Rolling Screen from laptop	WP 0012-3
4	No Audio from Media Player or Speakers	WP 0012-3
5	Picture missing a color	WP 0012-3
6	Laptop Video Driver problem	WP 0012-4
7	Skew off	WP 0012-4
8	No Picture on Projector	WP 0012-5
9	Microphone not working	WP 0012-6
10	Projector Lamp will not illuminate	WP 0012-6
11	Can not login from A/V System to Internet	WP 0012-6
12	System not grounded	WP 0012-6
	PROJECTOR	
1	Projector does not turn on	WP 0012-7
2	No picture	WP 0012-7
3	Blurred image	WP 0012-7
4	Remote control does not work	WP 0012-7
5	Indicator Lights: Power Events	WP 0012-7
5	Indicator Lights: Lamp Events	WP 0012-8
5	Indicator Lights: Thermal Events	WP 0012-8
	POWER	
1	No power to entire system	WP 0012-9
2	No power to individual components	WP 0012-9

END OF WORK PACKAGE

**OPERATOR TROUBLESHOOTING PROCEDURES
MEDIUM XGA PROJECTION SYSTEM
MECHANICAL TROUBLESHOOTING PROCEDURES**

INITIAL SETUP:

References
WP 0005

TROUBLESHOOTING PROCEDURES

This work package contains general information for troubleshooting the Medium XGA Projection System by user level qualified personnel. A qualified person is one who is familiar with this manual, the operation of the Medium XGA Projection System and the hazards involved in its operation and maintenance. The work package provides a systematic approach to locating and correcting malfunction of the Medium XGA Projection System. Each section is arranged according to the condition/indication of a problem. The corrective action items have been arranged in order of complexity, with the simpler actions listed first. Note that troubleshooting causes and actions beyond the scope of operator level qualified personnel are not included in the WP. If a course of action does not present itself, contact your supervisor.

The most important step of troubleshooting is to gather as much first-hand information as possible from the personnel who were present when the problem or failure occurred. Information as to how long the Medium XGA Projection System has been operating, what systems were connected, whether any protective equipment or devices functioned, etc., can also help isolate a problem. Note that if in any doubt about how to proceed, contact your supervisor before taking action.

WARNING

Tools, equipment, clothing and your body must be kept clear of all electrical connections, while power is applied to the system

Voltage sources, in addition to being an electrical shock hazard, may also potentially produce serious burns. Care should be exercised when using hand tools around exposed power connectors. Never let tools bridge two terminals.

If the circuit breaker does not stay in the ON position when energized, DO NOT attempt to energize repeatedly. This could cause damage to the surge protector or other components. Instead, investigate and identify the cause of the problem. Correct the situation before attempting to energize breaker again.

To avoid electrical shock and damage to the equipment, ensure the power cable is disconnected at the power source before removing or replacing any cables.

Table 1. Operator Troubleshooting – Mechanical.

ITEM	CONDITION/INDICATION	POSSIBLE MALFUNCTION	CORRECTIVE ACTION

END OF TASK

END OF WORK PACKAGE

**OPERATOR TROUBLESHOOTING PROCEDURES
MEDIUM XGA PROJECTION SYSTEM
VIDEO, PROJECTOR & POWER TROUBLESHOOTING PROCEDURES**

INITIAL SETUP:**References**

WP 0005, WP 0007, WP 0008

TROUBLESHOOTING PROCEDURES

This work package contains general information for troubleshooting the Medium XGA Projection System by operator level qualified personnel. A qualified person is one who is familiar with this manual, the operation of the Medium XGA Projection System and the hazards involved in its operation and maintenance. The work package provides a systematic approach to locating and correcting malfunction of the Medium XGA Projection System. Each section is arranged according to the condition/indication of a problem. The corrective action items have been arranged in order of complexity, with the simpler actions listed first. Note that troubleshooting causes and actions beyond the scope of operator level qualified personnel are not included in the WP. If a course of action does not present itself, contact your supervisor.

The most important step of troubleshooting is to gather as much first-hand information as possible from the personnel who were present when the problem or failure occurred. Information as to how long the Medium XGA Projection System has been operating, what systems were connected, whether any protective equipment or devices functioned, etc., can also help isolate a problem. Note that if in any doubt about how to proceed, contact your supervisor before taking action.

WARNING

Tools, equipment, clothing and your body must be kept clear of all electrical connections, while power is applied to the system

Voltage sources, in addition to being an electrical shock hazard, may also potentially produce serious burns. Care should be exercised when using hand tools around exposed power connectors. Never let tools bridge two terminals.

If the circuit breaker does not stay in the ON position when energized, DO NOT attempt to energize repeatedly. This could cause damage to the surge protector or other components. Instead, investigate and identify the cause of the problem. Correct the situation before attempting to energize breaker again.

To avoid electrical shock and damage to the equipment, ensure the power cable is disconnected at the power source before removing or replacing any cables.

Table 1. Operating Troubleshooting - Video

ITEM	CONDITION/INDICATION	POSSIBLE MALFUNCTION	CORRECTIVE ACTION
1	No Direct Video Feed from Source available	Video Source not active No video feed selected Cables not properly attached or unserviceable	Troubleshoot video source IAW app. TM Ensure video feed is set up IAW WP 0007 Check input cables for serviceability. If unserviceable replace cables Ensure cables are plugged into the proper input Contact DHS Systems
2	No Direct Video Feed Output	No video feed selected Mute Video button selected Correct Video input not set up Cables not properly attached or unserviceable	Ensure video feed is set up IAW WP 0007 Access Control Panel Check Mute Video button on left side of control panel is not selected. If selected, deselect button and test system Access Control Panel Select Video Input feed and Video Output feed. Check that video feed shows on Control Panel center window. If no feed is visible, check video source Check video OUTPUT for desired video is selected Check output cables for serviceability. If unserviceable replace cables Ensure cables are plugged into the proper output Ensure that 4-window configuration and output resolution have been selected

Table 1. Operating Troubleshooting – Video (Cont).

ITEM	CONDITION/INDICATION	POSSIBLE MALFUNCTION	CORRECTIVE ACTION
3	Rolling Screen from Laptop	Visible horizontal bar that is lighter than rest of the image “rolls” down the screen continually Ground loop Issue Power cables for the projector are run too close to the video cables Cables damaged or unserviceable caused by poor shielded cables	Connect the video source, A/V system and display to the same power source Ensure all are properly grounded. If needed a ground loop isolator can be used Video cabling and power cabling should never run parallel and close together. If two must cross, they should do so at a 90° angle. Most power is generated at 50 – 60Hz and most computer video is output at 60Hz. If your display supports it, you can set your laptop to output video at a higher frequency, (i.e. 70 – 75Hz). See computer video driver instructions Inspect cabling for damage. Try independently replacing both the cabling between laptop and the switch and between the switch and display
4	No audio from media player or playing out of speakers	Speakers are wired incorrectly Individual audio line is muted in the A/V System	Ensure speakers are plugged in, on and LEDs are illuminated. Make sure volume on the speakers themselves are turned up Check and ensure the audio source’s volume is up and not muted. Check the A/V system and ensure that neither the input being used, the speaker channel, nor the master audio is muted nor the volume is turned too low Check the cable and ensure that the cable from the speaker jack goes from the A/V system to LINE IN on the first speaker, and the cable from LINE OUT goes to LINE IN on the second speaker
5	Picture missing a color	The picture on the laptop looks correct, but colors on the screen are not correct	Open a color test image on your laptop to confirm it is a color problem. If the red, blue or green colors are completely missing, replace the cable. If all the bars are there but the colors are off, try adjusting images on the projector and/or laptop to clear up issue

Table 1. Operating Troubleshooting – Video (Cont).

ITEM	CONDITION/INDICATION	POSSIBLE MALFUNCTION	CORRECTIVE ACTION
5 (Cont)	Picture missing a color		If image on the A/V touch panel is fine, replace the cable between the A/V System and the projector If image on the touch panel is also having problems, replace the cable between laptop and the A/V System If replacing the cabling does not correct the problem, it may be a problem with the projector. Go into the menu and reset the projector to factory default settings If that does not correct the problem, turn off projector and wait until light on the projector turns all the way off. Unplug the projector, wait 15 seconds and plug it back in. If problem still is present, try a different projector Contact DHS Systems
		HD15 cable from A/V system to the projector is bad and a color is missing	Replace HD15 cable
6	Laptop video driver problem	Resolution is set incorrect on secondary display	Refer to instructions on video drivers
7	Skew off	The picture is blurry or out of focus, and some colors appear separated	Adjust skew on CATPro receiver Open the skew test image for the resolution of the display. On the back of the CATPro receiver is a knob labeled "adjust". It can be pushed in and turned left or right. Each time you push the knob in, it changes to a different color (red, blue or green). Pick a color and turn the knob left or right to adjust. You will see the color you are adjusting moving in relation to the other colors on the test image. Keep adjusting each color until all three colors on the test image are in a horizontal line

Table 1. Operating Troubleshooting – Video (Cont).

ITEM	CONDITION/INDICATION	POSSIBLE MALFUNCTION	CORRECTIVE ACTION
8	No picture on Projector	Port on the back of the laptop is not active Is video properly displaying on the touch panel	Check that source is outputting video (i.e. source is on, port is on laptop or laptop has the secondary display setup correctly) Ensure A/V System has inputs mapped to correct outputs Ensure cables are connected properly to input/output that you have connected to the A/V System Ensure (if using) CATPro receivers are plugged in and LEDs are illuminated A). Yes; replace the cable between the A/V System and the Projector B). No; replace the cable between the source and the A/V System. Confirm LEDs on front of Autopatch are illuminated. If not, reboot switch. If still no LEDs illuminate, replace Autopatch component Run a cable from source straight to Projector Resolved; run cable back through the projector and try a different input port but use the same output port as before Resolved; using the ICP, replace the internal cabling to that input Not Resolved; try a different output port from A/V system to the projector Resolved; replace internal cabling for that input Not Resolved; reset A/V system Not Resolved; reset projector to factory default settings Try a new projector Try a new source

Table 1. Operating Troubleshooting – Video (Cont).

ITEM	CONDITION/INDICATION	POSSIBLE MALFUNCTION	CORRECTIVE ACTION
9	Microphone not working	Microphone system is connected but not working	Verify microphone cable is hooked up to a MIC jack on the back of the A/V System and ensure you are getting sound from other devices through the speakers Ensure the volume for the MIC jack you are using is not muted and volume is turned up If using a condenser microphone, ensure Phantom power is turned on
10	Projector lamp will not illuminate	Phantom power is not turned on for audio line on the A/V system Lamp needs to be replaced	Refer to Lamp Maintenance section WP 0016
11	Can not login from A/V System from Internet Explorer	IP Address on system was changed to an unknown address	Ensure A/V System is connected to the network with a CAT5 cable to the CTR LAN jack Ensure the laptop you are using is connected to same network Type the IP address into the address bar of Internet Explorer Reset IP address by pressing CTRL IP RESET button on the back panel of the A/V system. Go back to IE and type default IP address for the system (192.168.2.200) Contact Network Administration to work through connection issues
12	System not grounded	A/V System not grounded	Connect ground cable to the same power source ground connection (trailer ground rod)

END OF TASK

Table 2. Operating Troubleshooting – Projector

ITEM	CONDITION/INDICATION	POSSIBLE MALFUNCTION			CORRECTIVE ACTION
1.	Projector does not turn on	There is no power from power cord Attempting to turn the projector on again during the cooling process			Plug the power cord into the AC inlet on the projector, and plug the power cord into the power outlet. If the power outlet has a switch, make sure that it is switched on Wait until the cooling down process has completed
2.	No picture	The video source is not turned on or connected correctly The projector is not correctly connected to the input signal device The input signal has not been correctly selected The lens cover is still closed			Turn the video source on and check that the signal cable is connected correctly Check the connection Select the correct input signal with the SOURCE key on the projector or remote control Open the lens cover
3.	Blurred image	The projection lens is not correctly focused The projector and the screen are not aligned properly The lens cover is still closed			Adjust the focus of the lens using the focus ring Adjust the projection angle and direction as well as the height of the projector if necessary Open the lens cover
4.	Remote control does not work	Battery discharged There is an obstacle between the remote control and the projector Too far away from the projector			Replace battery with new one Remove the obstacle Stand within 26 feet (8m) of the projector
5.	Indicator Lights: Power Events	Power	Temp	Lamp	Stand-by mode
		Blue Flashing	Off	Off	
		Power	Temp	Lamp	Powering up
		Blue	Off	Off	
		Power	Temp	Lamp	Normal operation
		Blue	Off	Off	

Table 2. Operating Troubleshooting – Projector (Cont).

ITEM	CONDITION/INDICATION	POSSIBLE MALFUNCTION			CORRECTIVE ACTION
5. (Cont)	Indicator Lights: Power Events (Cont)	Power	Temp	Lamp	1. The projector needs 90 seconds to cool down as it was abnormally shut down without the normal cooling down process Or
		Blue Flashing	Off	Off	2. The projector needs to cool for 90 seconds after the power is turned off Or
	Indicator Lights: Lamp Events	Power	Temp	Lamp	3. The projector has shut down automatically. If you try to re-start the projector, it will shut down again. Contact DHS Systems for assistance
		Purple Flashing	Off	Red	The projector has shut down automatically. If you try to restart the projector, it will shut down again Or Contact DHS Systems for assistance
	Indicator Lights: Thermal Events	Power	Temp	Lamp	The projector needs 90 seconds to cool down Or
		Off	Off	Red	Contact DHS Systems for assistance
		Power	Temp	Lamp	The projector has shut down automatically. If you try to restart the projector, it will shut down again Or Contact DHS Systems for assistance
		Off	Red	Off	
		Off	Red	Red	
		Off	Red	Green	
		Red	Red	Red	
		Red	Red	Green	
		Blue	Red	Red	
		Blue	Red	Green	
		Purple	Red	Red	
		Purple	Red	Green	
		Off	Green	Red	

END OF TASK

Table 3. Operating Troubleshooting – Power.

ITEM	CONDITION/INDICATION	POSSIBLE MALFUNCTION	CORRECTIVE ACTION
1	No power to entire system	Check power source Check power cable connection Power switched off	Ensure power source is providing 110VAC at 60HZ. Correct if necessary Inspect cables and connectors for damage, if damaged replace cables. Check Power switch is set to 'ON' Contact DHS Systems
2	No power to individual components	Power switched off Individual components power switch turned off	Check Power switch is set to 'ON' Check individual components and insure all power switches are set to ON Contact DHS Systems

END OF TASK**END OF WORK PACKAGE**

CHAPTER 4

OPERATOR INSTRUCTIONS

FOR

DC2E

MEDIUM XGA PROJECTION SYSTEM

**OPERATOR MAINTENANCE PROCEDURES
MEDIUM XGA PROJECTION SYSTEM
SERVICE UPON RECEIPT**

INITIAL SETUP:**Personnel Required:**

Two

ReferencesWP 0005

GENERAL

The following procedures are required to be performed by the operator in order to prepare the DC2E Medium XGA Projection System and its contents for use.

SITE SELECTION

To ensure minimal problems with set-up of the Medium XGA Projection System and good operation of equipment being used in conjunction with it, ensure area is:

Dry and environmentally controlled

Protected area to run cables from Medium XGA Projection System to ancillary equipment

POWER REQUIREMENTS

The Medium XGA Projection System requires 110 VAC of surge protected power to operate.

SERVICE UPON RECEIPT

Inspect each system component for damage incurred during shipment. If any damage is visible, notify supervisor. Report the damage on SF361, Transportation Discrepancy Report. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with applicable service instructions.

Once all covers are removed, inspect the system and each piece of ancillary equipment. Inspect all connectors, cables, and loose pieces of equipment located in the boxes. Refer to PMCS before placing equipment in service.

INSTALLATION INSTRUCTIONS

The Medium XGA Projection System requires assembly to place into operation. To set up the Medium XGA refer to WP 0005 of this TM for setup and power up procedures.

PRELIMINARY SERVICING OF EQUIPMENT**WARNING**

When working on the Medium XGA Projection System, do not operate the equipment if the case or equipment shows signs of moisture or water intrusion. Electrical shock can cause personnel injury or death and may result in damage to equipment.

Do not apply power in the system is not properly grounded to the power source. Electrical shock can cause personnel injury or death and may result in damage to equipment.

The Medium XGA Projection System does not require a preliminary service. Daily checks are addressed in the PMCS tables located in WP 0015 of this TM.

END OF WORK PACKAGE

**OPERATOR MAINTENANCE INSTRUCTIONS
MEDIUM XGA PROJECTION SYSTEM
PMCS INTRODUCTION**

GENERAL

This Work Package provides data necessary to keep the DC2E Medium XGA Projection System operational ready. PMCS are performed to keep the equipment in operational condition. The checks are used to find, correct, and report problems. Personnel trained on the equipment are required to perform the tasks as indicated in Operator PMCS (WP 0015), Table 1. PMCS are performed by the operator each time the equipment is operated.

WARNINGS AND CAUTIONS

Special attention should be paid to the WARNINGS and CAUTIONS appearing in the operator PMCS table. A WARNING means someone could be injured. A CAUTION means equipment could be damaged.

EXPLANATION OF TABLE ENTRIES

Item Number – Numbers in this column are for reference. When completing DA Form 2404/ DA Form 5988E (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers appear in the order in which the checks/services are performed for the interval listed.

Interval – This column indicates when a procedure must be performed (i.e., Before, During, or After an operation).

Item to Be Checked or Serviced – This Column identifies the item that is to be checked or serviced.

Procedure – This column describes the procedure that must be followed to ensure that the equipment is capable of performing its intended mission.

Equipment Not Ready/Available If – This column lists conditions that make the Medium XGA Projection System not fully mission capable. If the problem can be fixed using the troubleshooting procedures and/or maintenance procedures in this manual, do so. If not, document the items not able to be fixed on DA Form 2404/DA Form 5988E for operator maintenance. For further information on how to use this form, see DA PAM 750-8. Be sure to observe and annotate all special circumstances that appear/occur.

NOTE

Perform weekly as well as before PMCS if you are the assigned operator but have not operated the equipment since the last weekly inspection, or if you are operating the equipment for the first time.

If the equipment must be kept in continuous operation, only perform those procedures that will not disturb operation. Complete checks and services when the equipment is shut down.

END OF WORK PACKAGE

**OPERATOR MAINTENANCE INSTRUCTIONS
MEDIUM XGA PROJECTION SYSTEM
SERVICE – PMCS**

INITIAL SETUP:**References**

WP 0005, WP 0006, WP 0007

Table 1. Operator Preventive Maintenance Checks and Service

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED AVCS	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	BEFORE	Medium XGA Projection System Cases	1. Inspect case for cracks, damaged, loose or missing hardware. 2. Inspect case interior for moisture or dirt. Clean and dry as necessary.	Case interior shows signs of moisture or equipment excessively dirty
2	BEFORE	Cables and connectors	1. Check entire length of cable for cuts, gashes, or physical damage. 2. Check cable connectors for damage. 3. Ensure cable connections are secure. Tighten if necessary.	Cables cannot be attached properly, pins are missing or bent, or there is corrosion or dirt that cannot be removed.
3	BEFORE	PROJECTOR Exterior surface	1. Check exterior for damage, loose hardware and cleanliness.	Damage to exterior surfaces prevents controls or connectors from functioning properly.
4	BEFORE	Cables and connectors	1. Ensure cable connectors are secure. Tighten if necessary. 2. Check cable connectors for damage	Cables cannot be attached properly, pins are missing or bent, or there is corrosion or dirt that cannot be removed.
5	BEFORE	Lens	Clean projector lens by wiping with cleaning cloth that contains a small amount of non-abrasive camera lens cleaner or with lens cleaning paper	

Table 1. Operator Preventive Maintenance Checks and Service (Cont).

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED AVCS	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
6	BEFORE	Projector lamp	Inspect for weak or burnt out lamp bulb.	Lamp does not illuminate.
7	DURING	Cooling vents on projector	Ensure equipment cooling vents are free from obstructions.	Equipment cooling vents are blocked or damaged.
8	BEFORE	Medium XGA (DISPLAY) SCREEN Screen	1. Check screen for tears, missing snaps and cleanliness. 2. Check frame assembly for damage, loose hardware and completeness.	Damage to screen prevents mounting to frame assembly or reduces usable display area. Damage to frame assembly prevents mounting of the screen.
9	BEFORE	Speakers	1. Ensure there is no physical damage to speaker case 2. Check connector for damage.	Cables cannot be attached properly, pins are missing or bent, or there is corrosion or dirt that cannot be removed.
10	BEFORE	Microphones	1. Ensure there is no physical damage to base and stem. 2. Check electrical connectors on base, microphone, and pigtail to ensure there are no bent or damaged pins or corrosion. 3. Ensure switches on base are in proper working condition.	Cables cannot be attached properly, pins are missing or bent, or there is corrosion or dirt that cannot be removed. Switches are not operating properly.
11	AFTER	PROJECTOR Projector housing	Clean air vents with brush to maintain air flow.	Damage prevents equipment from functioning properly.
12	AFTER	Lens cap	Check that protective lens cap is in place.	

END OF WORK PACKAGE

**OPERATOR MAINTENANCE INSTRUCTIONS
MEDIUM XGA PROJECTION SYSTEM
EQUIPMENT MAINTENANCE PROCEDURES**

GENERAL

This work package provides information needed by the Operator when performing the following services to the Medium XGA Projection System. They consist of:

- Cleaning the Medium XGA Projection System
- Cleaning the Cables
- Cleaning the Projector
- Cleaning the Screen
- Cleaning Projector Lens
- Replacing Projector Lamp

WARNING

Voltage sources, in addition to being an electrical shock hazard, may also potentially produce serious burns. Care should be exercised when using water around exposed power connections. Ensure that all power to the system has been shut off before disassembling and cleaning the components of the Medium XGA Projection System.

CAUTION

Use of a damp cloth is authorized for cleaning the case and cables but care should be exercised to ensure that water does not get into the connection of the cables or the electrical components. Damage to the components may result from water, if water gets into the connections, blow the connections out with compressed air, or allow to air dry before connecting back to equipment.

CAUTION

The projector contains moving parts that have limited life-expectancies. After 4000 hours, or in a mission critical application, it is recommended that the projector be given preventive maintenance by specially trained maintenance personnel in order to help ensure long term stable operation. Contact DHS Systems for additional information pertaining to preventative maintenance.

WARNING

THIS PRODUCT CONTAINS NO USER SERVICEABLE PARTS. NEVER OPEN THE PROJECTOR EXCEPT FOR LAMP REPLACEMENT, AS THIS WILL VOID ANY WARRANTIES. REFER SERVICE AND REPAIR TO SPECIALLY TRAINED MAINTENANCE PERSONNEL ONLY.

CLEANING THE MEDIUM XGA PROJECTION SYSTEM

INITIAL SETUP:**Tools and Special Tools**

Damp Cloth
Stiff Bristled Brush

Personnel Required

One

Materials/Parts

Water
Denatured Alcohol

Equipment Condition

Equipment Powered Down
Power Source Disconnected

WARNING

Voltage sources, in addition to being an electrical shock hazard, may also potentially produce serious burns. Care should be exercised when using water around exposed power connections. Ensure that all power to the system has been shut off before disassembling and cleaning the components of the Medium XGA Projection System.

CAUTION

Use of a damp cloth is authorized for cleaning the case and cables but care should be exercised to ensure that water does not get into the connection of the cables or the electrical components. Damage to the components may result from water, if water gets into the connections, blow the connections out with compressed air, or allow to air dry before connecting back to equipment.

SERVICE

1. Verify that the Medium XGA Projection System has been shut down and the power source has been disconnected.
2. Disconnect all cables attached to the Medium XGA Projection System.
3. Clean off any severe dirt or mud from the outer case using a stiff bristled brush.
4. Use a vacuum or compressed air to remove any loose debris from inside the Medium XGA Projection System cases.
5. Clean the outer surface of the case and the interior surface of the case using a damp cloth. Use care not to get any water on the face of the electrical components.
6. Dry any excess water from the inside of the case using a lint free cloth.
7. Clean the face and rear of electrical components using Electronic Anti-Static/Alcohol Free Cleaning Wipes.

CAUTION

Do not use any water to clean out the connectors. Water can cause corrosion or rust preventing the connectors from making a proper connection.

8. Ensure the dust covers seal properly.

END OF TASK

CLEANING THE EQUIPMENT CASES

INITIAL SETUP:**Tools and Special Tools**

Damp Cloth
Stiff Bristled Brush

Personnel Required

One

Materials/Parts

Water
Denatured Alcohol

Equipment Condition

Equipment Powered Down
Power Source Disconnected

CAUTION

Use of a damp cloth is authorized for cleaning the case and cables but care should be exercised to ensure that water does not get into the connection of the cables or the electrical components. Damage to the components may result from water, if water gets into the connections, blow the connections out with compressed air, or allow to air dry before connecting back to equipment.

SERVICE

1. Clean off any severe dirt or mud from the outer case using a stiff bristled brush.
2. Use a vacuum or compressed air to remove any loose debris from inside the ancillary case.
3. Clean the outer surface of the case and the interior surface of the case with a damp cloth.
4. Dry any excess water from the inside of the case using a lint free cloth.

END OF TASK

CLEANING THE MEDIUM XGA PROJECTION SYSTEM CABLES

INITIAL SETUP:**Tools and Special Tools**

Sponge/Rag/paper towels

References**Materials/Parts**

Water

Denatured Alcohol

Cable Ties

Equipment Condition

Equipment Powered Down

Power Source Disconnected

WARNING

Voltage sources, in addition to being an electrical shock hazard, may also potentially produce serious burns. Care should be exercised when using water around exposed power connections. Ensure that all power to the system has been shut off before disassembling and cleaning the components of the Medium XGA Projection System.

CAUTION

Use of a damp cloth is authorized for cleaning the case and cables but care should be exercised to ensure that water does not get into the connection of the cables or the electrical components. Damage or corrosion may result from water contamination, if water gets into the connections, blow the connections out with compressed air, or allow to air dry before connecting back to equipment.

SERVICE

1. Verify that the Medium XGA Projection System has been shut down and the power source has been disconnected.
2. Disconnect all cables from the Medium XGA Projection System and accessory devices.
3. Inspect all cables for damaged wiring or connectors.
4. Clean the body of the wiring using a damp lint free cloth.
5. Use compressed air to clean dust and debris from the ends of the connections.
6. Replace all dust covers on cable ends.
7. If storing roll cables and secure with cable ties to prevent tangling of cables when stored.
8. Store or reconnect cables as needed.

END OF TASK

CLEANING THE MEDIUM XGA PROJECTION SYSTEM PROJECTOR

INITIAL SETUP:**Tools and Special Tools**

Damp Cloth
Vacuum

References**Materials/Parts**

Water

Equipment Condition

Equipment Powered Down
Power Source Disconnected

NOTE

The projector requires little maintenance. The only thing that is required on a regular basis is to the lens clean.

WARNING

Voltage sources, in addition to being an electrical shock hazard, may also potentially produce serious burns. Care should be exercised when using water around exposed power connections. Ensure that all power to the system has been shut off before cleaning the Projector. Never open the Projector, as this will void any warranties.

CAUTION

Use of a **damp cloth** is authorized for cleaning the Projector's exterior body only and care should be exercised to ensure no liquid enters the inside of the Projector. Allow the Projector to air dry before applying power.

CAUTION

The Projector Len is sensitive to scratches. Only use lens cleaning tissue to prevent scratches to the projector lens. Replace lens cap when not in use.

SERVICE

1. Verify that the Medium XGA Projection System has been shut down and the power source has been disconnected.
2. Disconnect all cables from the Projector.
3. Inspect the exterior body of the Projector for damage.
4. Clean the exterior body of the Projector using a **damp** lint free cloth with clean water.
5. Use a vacuum to clean all the air vents to maintain sufficient air flow.
6. Use lens cleaning tissues to clean the lens. Replace lens cap when not in use.

END OF TASK

CLEANING THE MEDIUM SXGA+ PROJECTION SYSTEM SCREEN

INITIAL SETUP:**Tools and Special Tools**

White Clean Cloth (100% Cotton preferred)

Personnel Required

One

Materials/Parts

Water

Denatured Alcohol

Simple Green

Equipment Condition

NOTE

Simple Green solution may be used as an alternate cleaning material.

WARNING

Make sure the surface does not come in contact with a painted, varnished, plastic, or dyed surface or object. Prolonged contact with any one of these materials could cause a chemical reaction and compromise the screen's physical or optical quality.

SERVICE

1. Using a clean white cloth (100% cotton preferred) dampened with clear water; gently wipe the soiled area in one direction. Note, do not use a circular motion.
2. Using a dry 100% cotton cloth, wipe dry after each cleaning session.
3. To clean a stubborn stain or a sticky surface, use a 100% clean white cloth dampened with denatured alcohol or Simple Green solution and gently wipe the soiled area in one direction.
4. Using a clean cotton cloth, dry area.

END OF TASK

CLEANING THE PROJECTOR LENS

INITIAL SETUP:**Tools and Special Tools**

Canister of Compressed Air
Clean White Lint Free Cloth

Personnel Required

One

Materials/Parts

Lens Cleaning Tissue Paper
Lens Cleaning Solution

Equipment Condition

Projector Powered Down

CAUTION

Never rub the lens with abrasive material.

WARNING

Lens may be hot. Allow lens to cool down before cleaning.

SERVICE

1. Use a canister of compressed air to remove dust.
2. If there is dirt or smears, use lens cleaning tissue paper or a clean white lint free cloth moisten with lens cleaning solution and gently wipe the lens surface.
3. Using a clean white lint free cloth, dry lens.

END OF TASK

REMOVAL AND REPLACEMENT OF PROJECTOR LAMP

INITIAL SETUP:**Tools and Special Tools**

Flat tip Screwdriver

Personnel Required

One

Materials/Parts

Lamp Assembly p/n RLC-047

Equipment ConditionEquipment Powered Down
Power Source Disconnected

NOTE

The lamp indicator lights up red or a message will appear on the screen suggesting it is time to replace the lamp.

CAUTION

Only use recommended lamp replacement bulb number RLC-047.

WARNING

Be careful not to touch the lamp glass when replacing the lamp module, this may cause the glass to overheat and break while in use.

WARNING

Be extremely careful when removing the lamp module. In the unlikely event that the bulb ruptures, small glass fragments may come loose.

WARNING

Hg – Lamp contains mercury. Disposal of lamp must be in accordance with local disposal laws.

The projector bulb has an approximate life span of 3000/4000 hours and must be changed to prevent the bulb from exploding and causing damage to the projector or personnel.

- To reduce the risk of electrical shock, always turn the projector off and disconnect the power cord before changing the lamp.
- To reduce the risk of severe burns, allow the projector to cool for at least 45 minutes before replacing the lamp.
- To reduce the risk of injuries to fingers and damage to internal components, use caution when removing lamp glass that has shattered into sharp pieces. Before replacing the lamp, clean the lamp compartment and dispose of cleaning materials. Be careful of sharp edges in the lamp compartment. Wash hands after lamp replacement
- Always replace lamp with the same type and rating.

REMOVAL PROCEDURES

1. Turn the power off and disconnect the projector from the wall socket. If the lamp is hot, avoid burns by waiting for approximately 45 minutes until the lamp has cooled.
2. Lay the projector vent side up on a clean flat surface.
3. Using a flat tipped screwdriver remove two cover screws as shown in Figure 1.
4. Lift and remove cover as shown in Figure 1 to expose the projector lamp module.

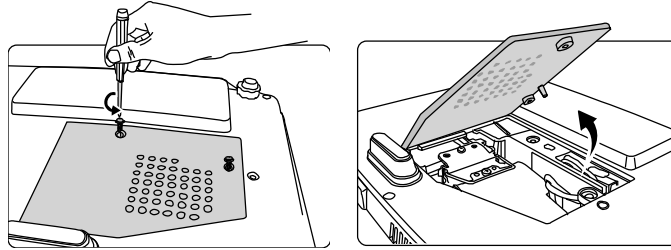


Figure 1. Removing Lamp Cover.

WARNING

Do not turn the power on with the lamp cover removed.

Do not insert your fingers between the lamp and the projector. The sharp edges inside the projector may cause injuries.

4. Using a flat tipped screwdriver, loosen and remove the screw that secures the lamp assembly as shown in Figure 2.
5. Pull out the lamp connector from a slot in the lamp compartment and disconnect lamp connector from the projector as shown in Figure 2.

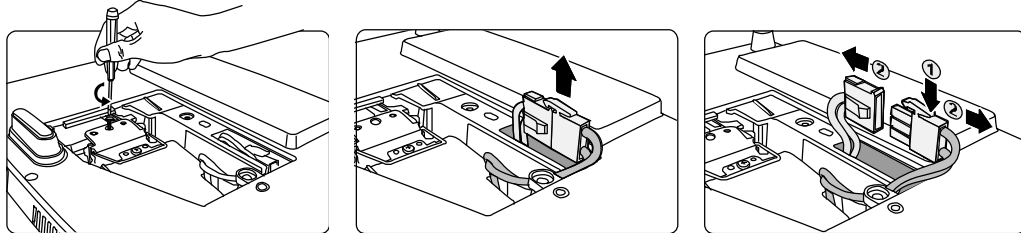


Figure 2. Disconnecting Lamp Assembly.

REMOVAL PROCEDURES (Cont)

6. Lift the handle as shown in Figure 3 so that it stands up. Use the handle to slowly and carefully pull the lamp assembly out of the projector.

CAUTION

Pulling the lamp assembly too quickly, may cause the lamp to break and scatter broken glass into the projector.

Do not insert your hands or fingers into the projector after the lamp assembly is removed. If you touch the optical components inside, it could cause color unevenness and distortion of the projected image.

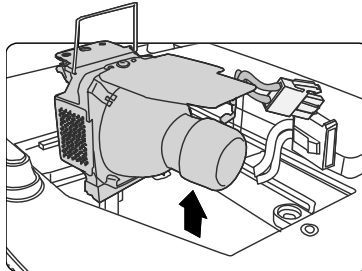


Figure 3. Removing Lamp Assembly.

END OF TASK**REPLACEMENT PROCEDURES****WARNING**

Be careful not to touch the lamp glass when replacing the lamp module, this may cause the glass to overheat and break while in use.

7. Insert the new lamp into the lamp compartment and make sure it fits in the projector as shown in Figure 4.

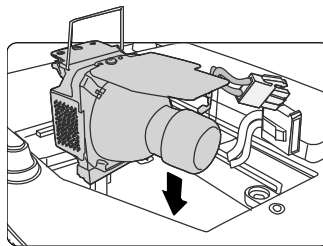


Figure 4. Installing New Lamp Assembly.

REPLACEMENT PROCEDURES (Cont)

8. Reconnect the lamp connector and place it back into its slot to be flush with the projector (see Figure 5).

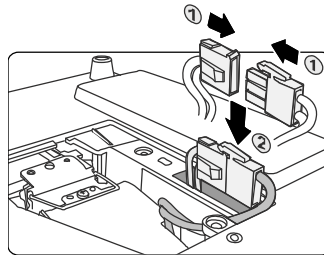


Figure 5. Reconnecting Lamp Assembly.

9. Using a flat-tipped screwdriver, tighten screw that secures the lamp as shown in first illustration or Figure 6.

CAUTION

A loose screw may cause a bad connection, which could result in malfunction. Do not over tighten the screw.

10. Ensure the handle is fully laid flat and locked in place.

11. Replace the lamp cover on the projector as shown in the middle illustration of Figure 6.

12. Using a flat-tipped screwdriver, tighten two screws that secure the lamp cover as shown in Figure 6. Do not over-tighten the screws.

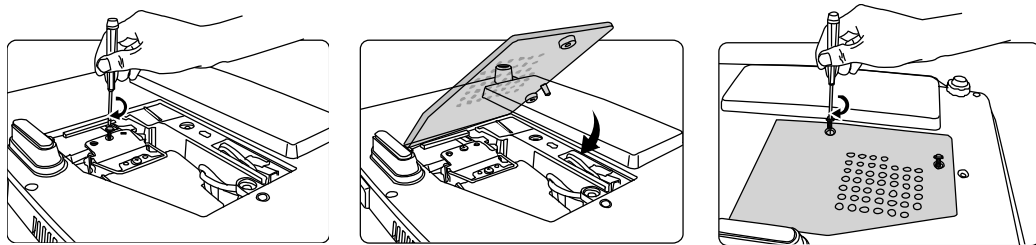


Figure 6. Reinstalling Lamp Cover.

CAUTION

Do not turn the power on with the lamp cover removed.

13. Restart the projector.

END OF TASK

RESETTING THE LAMP TIMER**CAUTION**

Do not reset the timer if the lamp is not new or replaced as this could cause damage.

14. Once the startup logo appears, open the On-Screen Display (OSD) menu. Go to the **SYSTEM SETUP: Advanced > Lamp Settings** menu. Press **MODE/ENTER**. The **Lamp Settings** page displays. Press **▼** to highlight **Reset lamp timer** and press **MODE/ENTER**. A warning message displays asking if you want to reset the lamp timer (see Figure 7). Highlight **Reset** and press **MODE/ENTER**. The lamp time will be reset to '0'.

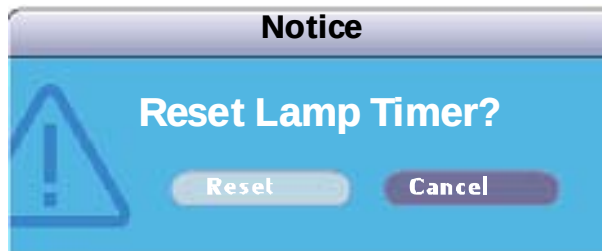


Figure 7. Resetting Lamp Timer.

END OF TASK

END OF WORK PACKAGE

CHAPTER 5

DESTRUCTION OF EQUIPMENT
FOR

DC2E

MEDIUM XGA PROJECTION SYSTEM

**DESTRUCTION OF EQUIPMENT TO PREVENT ENEMY USE
MEDIUM XGA PROJECTION SYSTEM
GENERAL INFORMATION**

SCOPE

This work package is for guidance of those whose duty it is to render inoperable or destroy equipment which is in imminent danger of capture by an enemy.

AUTHORIZATION

Only division or higher commanders have the authority to order destruction of equipment. They may however, delegate this authority to subordinate commanders when the situation demands it.

REPORTING DESTRUCTION

Destruction of equipment will be reported through command channels.

METHODS OF DESTRUCTION

Choose methods of destruction which will cause such damage that it will be impossible to restore the equipment to a usable condition within the combat zone. The following methods of destruction may be used separately or in combination, depending on the type of equipment and the degree to which each method is used.

SELF-DESTRUCTION

Built-in self-destruction devices should be set off even if the major item containing equipment with self-destruction devices is to be destroyed. These devices should be permitted to do their work at least partially before incendiaries or explosives (especially the latter) are set off. Currently, the Medium XGA Projection System contains no built-in self-destruction devices.

IMPROPER OPERATION

The short circuiting of a power source and the application of an over voltage to equipment are examples of improper operation. This method of destruction has a limited application to electronics material.

FIRE

The starting of fires on or near electronic equipment is particularly useful in destroying predominantly nonmetallic components such as transistors, diodes, resistors, capacitors, switches, and printed circuit boards. Fires should be lit after setting off explosives and/or completing mechanical destruction. Fires within partially closed cabinets tend to be less effective than open fires, since a closed area does not allow sufficient oxygen necessary for an intense flame. Heat sources which do not require an air supply, such as thermite-based devices or incendiary grenades, are not subject to this limitation. The use of fire is associated with numerous hazards, including the possibility of disclosing positions which are under enemy visual or infrared surveillance.

WEAPONS FIRE

The use of weapons fire is less desirable than mechanical destruction, and is practically useless against heavy gauge metal panels and metal castings. However, optics such as night observation equipment are easily destroyed by correctly aimed gunfire.

DEMOLITION (EXPLOSIVES)

Explosives refer to TNT, plastic explosives, as well as fragmentation grenades. Explosives are most effective against structures and components which will not burn, or are too heavy or too strong to be easily demolished by mechanical means. The use of explosives has the disadvantage of possible disclosure of position when enemy forces are using sound-ranging-type equipment.

MECHANICAL DESTRUCTION

Mechanical destruction includes smashing electronic components, bending chassis or sub chassis, slashing cables and wiring, or any similar action. Dropping a weight on equipment and throwing lightweight equipment over a cliff are also examples of mechanical destructions. Sledges, hammers, axes or heavy tools are examples of the implements which can be used. Mechanical destruction should be completed before fires are lit.

USE OF NATURAL SURROUNDINGS

The disposal or denial to the enemy of electronics material may be accomplished in the field by taking advantage of the natural surroundings and environment.

Submergence of equipment and repair parts under water (lakes, ponds, streams, etc), concealment by hiding material in caves or, preferably burial can be used effectively. Where the surrounding area does not lend itself to such disposal, widely dispersed scattering of material, preferably, into heavy underbrush, can serve as a denial or delaying measure in the event the area is recaptured.

CLASSIFIED EQUIPMENT

Classified equipment must be destroyed to such a degree as to prevent duplication by, or revealing means of operation or function to the enemy.

ASSOCIATED CLASSIFIED DOCUMENTS

Any classified documents, notes, instructions, or other written material pertaining to function, operation, maintenance, or employment, including drawings or parts lists, must be destroyed in a manner to render them useless to the enemy.

END OF WORK PACKAGE

**DESTRUCTION OF EQUIPMENT TO PREVENT ENEMY USE
MEDIUM XGA PROJECTION SYSTEM
DESTRUCTION PROCEDURES**

SCOPE

This work package is for guidance of those whose duty it is to render inoperable or destroy the DC2E Medium XGA Projection System which is in imminent danger of capture by an enemy.

METHOD OF DESTRUCTION

Command decision, according to the tactical situation will determine when the using organization is to destroy a Medium XGA Projection System. A destruction plan will be prepared by the using organization, unless one was prepared by a higher authority. For general vehicle destruction procedures, refer to TM 750-244-6, Procedures for Destruction of Tank Automotive Equipment to Prevent Enemy Use (U.S. Army Tank-Automotive and Artillery Command).

MEDIUM SXGA+ PROJECTION SYSTEM EQUIPMENT DESTRUCTION PROCEDURES

The following procedures should be followed when time does not permit critical equipment to be destroyed individually.

DEMOLITION/EXPLOSIVES**WARNING**

Personnel should stand clear of area being destroyed by weapons fire. Always use a weapon of a caliber sufficient to ensure enough penetration to achieve the desired damage and to eliminate the possibility of ricochet. Personnel unfamiliar with explosives should not set or detonate explosives.

The use of explosives has the disadvantage of possible disclosure of position.

The Medium XGA can be destroyed using incendiary grenades, several rounds of properly aimed weapons fire, or a sufficient amount of explosives.

WARNING

Toxic fumes may result from burning electrical equipment found in the Genset. Fires should be lit only in open areas. Avoid inhaling fumes from burning components.

FIRE

Fires should be started after setting off explosives. Gasoline, kerosene, diesel, or oil may be used to destroy smaller components such as the Medium XGA Projection System accessories.

END OF WORK PACKAGE

CHAPTER 6
SUPPORT INFORMATION
FOR
DC2E
MEDIUM XGA PROJECTION SYSTEM

SUPPORTING INFORMATION
MEDIUM XGA PROJECTION SYSTEM
COMPONENTS OF END ITEM (COEI) AND EXPENDABLE ITEM LISTS

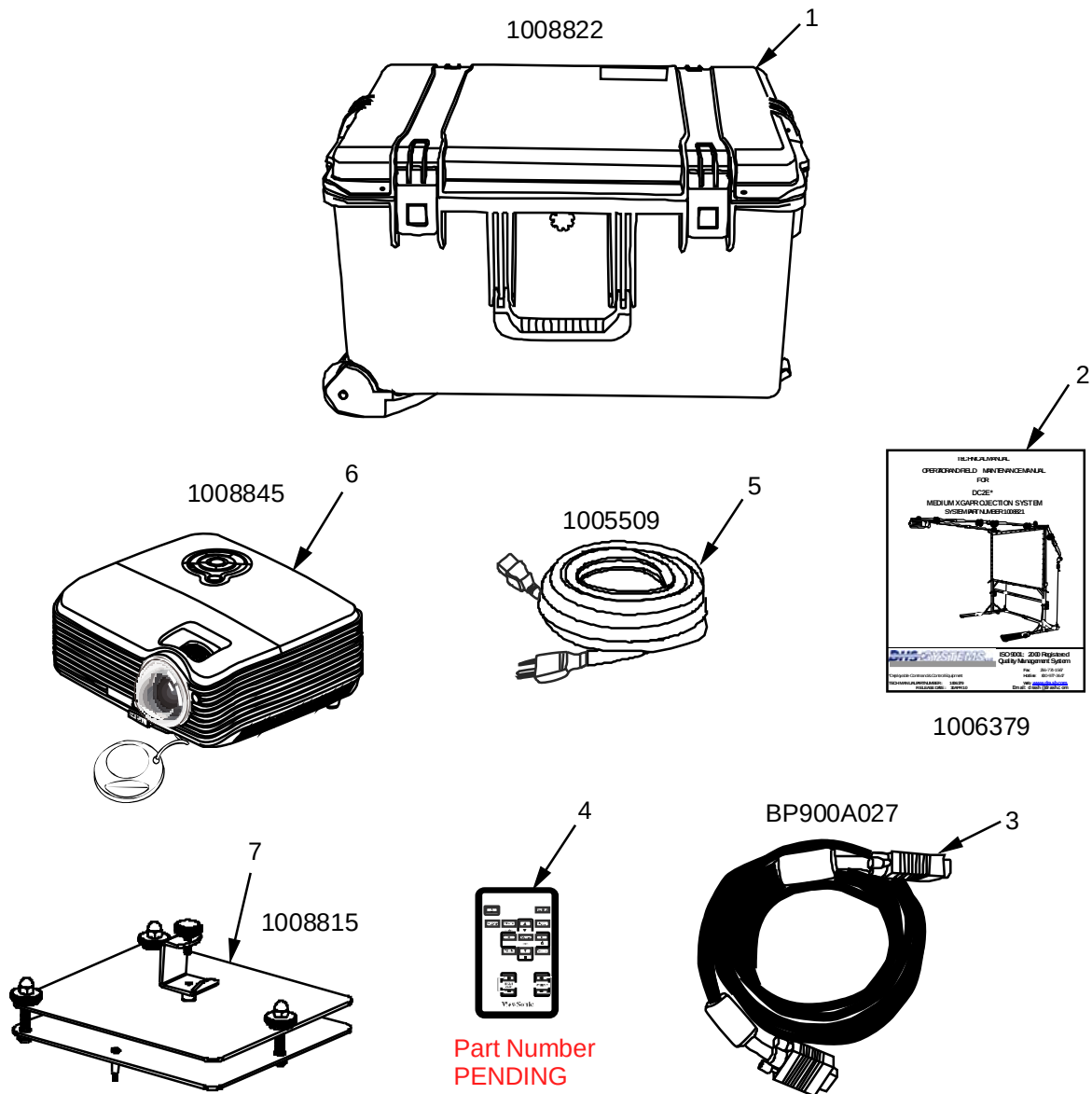


Figure 1. Components of End Item.

Table 1. Components of End Item List.

(1) Illus Number	(2) National Stock Number	(3) Component Part Number	(4) Description, Part Number/(CAGEC)	(5) U/I	(6) Qty Rqr
1		1008822	CASE, TRANSPORT, FOR PROJECTOR, MOLDED RESIN, 24.5"L x 19.5"W x 14.5"H (0WFM3)	EA	1
2		1006379	MANUAL, OPERATION & MAINTENANCE (0WFM3)	EA	1
3		BP900A027	CABLE, HD15 (M/M), 25' (0WFM3)	EA	1
4		PENDING	CONTROL, REMOTE, PJD5351 PROJECTOR (0WFM3)	EA	1
5		1005509	CABLE, POWER, 5-15P/C13 18/3 SJTW (0WFM3)	EA	1
6		1008845	PROJECTOR, PJD5351, XGA, 185 WATT (0WFM3)	EA	1
7		1008815	ASSEMBLY, ADJUSTABLE PROJECTOR MOUNT (0WFM3)	EA	1

COMPONENTS OF END ITEM – Continued

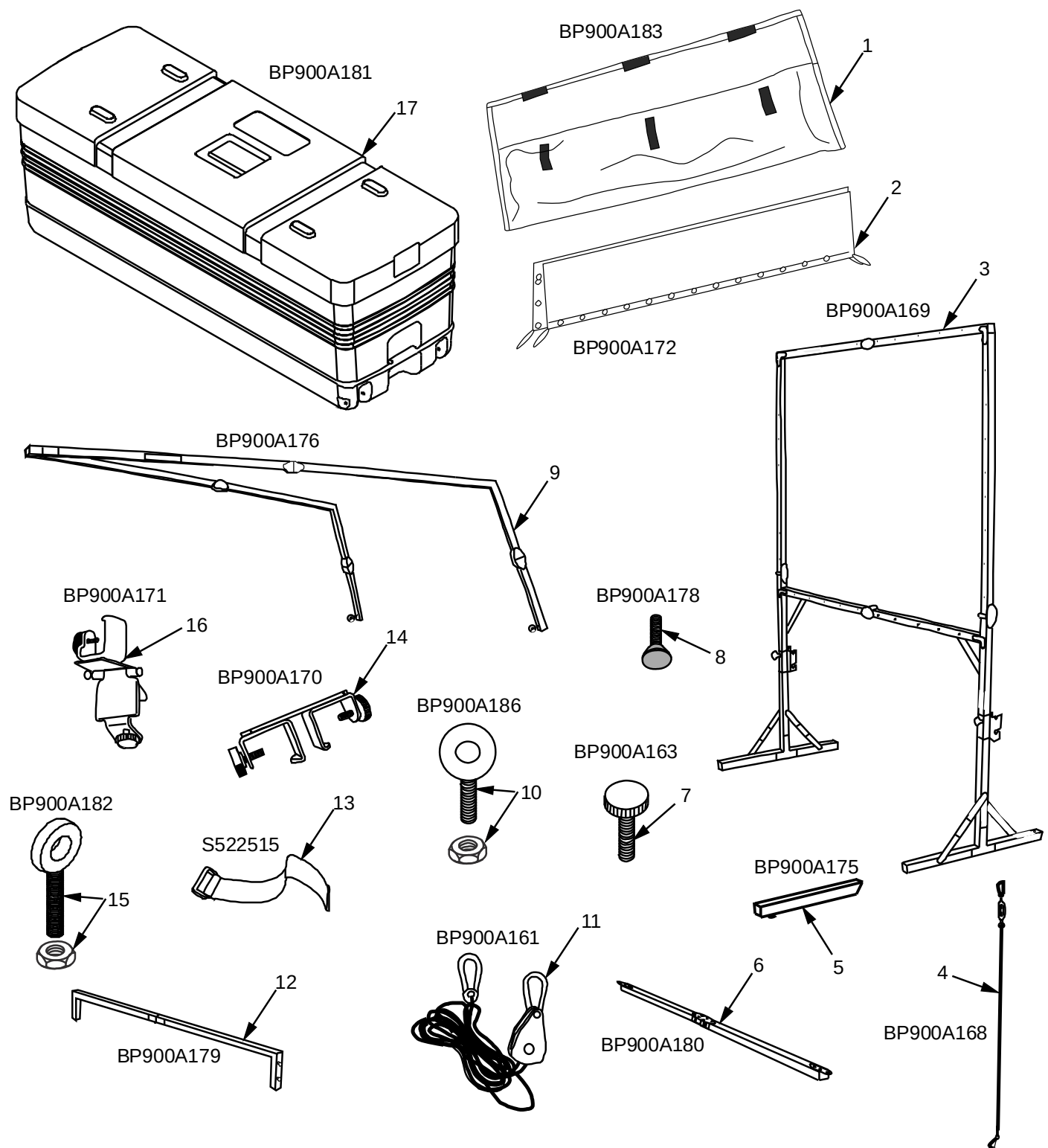


Figure 1. Components of End Item (Cont).

COMPONENTS OF END ITEM – Continued

Table 1. Components of End Item List (Cont).

(1) Illus Number	(2) National Stock Number	(3) Component Part Number	(4) Description, Part Number/(CAGEC)	(5) U/I	(6) Qty Rqr
1		BP900A183	POUCH, SINGLE SURFACE, 45" x 60" (0WFM3)	EA	1
2		BP900A172	SCREEN, SINGLE SURFACE, 45" x 60" (0WFM3)	EA	1
3		BP900A169	FRAME, 45" x 60", FRAME ONLY (0WFM3)	EA	1
4		BP900A168	CABLE, ADJUSTABLE, STEEL (0WFM3)	EA	2
5		BP900A175	FOOT EXTENSION (0WFM3)	EA	2
6		BP900A180	CROSSBAR, SUPPORT LOWER (0WFM3)	EA	1
7		BP900A163	KNOB, PLASTIC, 1/4-20 x 3/4", 1" DIA (0WFM3)	EA	1
8		BP900A178	FEET, RUBBER (0WFM3)	EA	10
9		BP900A176	ARM, PROJECTOR SUPPORT (0WFM3)	EA	1
10		BP900A186	BOLT, EYE, 1/4-20 x 2", SS, w/HEX (0WFM3)	EA	2
11		BP900A161	TIE-DOWN, QUICKIE, 1/4" (0WFM3)	EA	2
12		BP900A179	CROSSBAR, SUPPORT UPPER (0WFM3)	EA	1

Table 1. Components of End Item List (Cont).

(1) Illus Number	(2) National Stock Number	(3) Component Part Number	(4) Description, Part Number/(CAGEC)	(5) U/I	(6) Qty Rqr
13		S522515	STRAP, CINCH, 2" x 9.5", BLACK (0WFM3)	EA	5
14		BP900A170	CLAMP, DELUXE, STRAIGHT, JOINING (0WFM3)	EA	1
15		BP900A182	BOLT, EYE with NUT (0WFM3)	EA	2
16		BP900A171	CLAMP, DELUXE, HINGE, JOINING (0WFM3)	EA	2
17		BP900A181	CASE, TRANSPORT, POLY w/WHEELS	EA	1

END OF WORK PACKAGE